Vol. 1142 Number 5

OFFICIAL GAZETTE

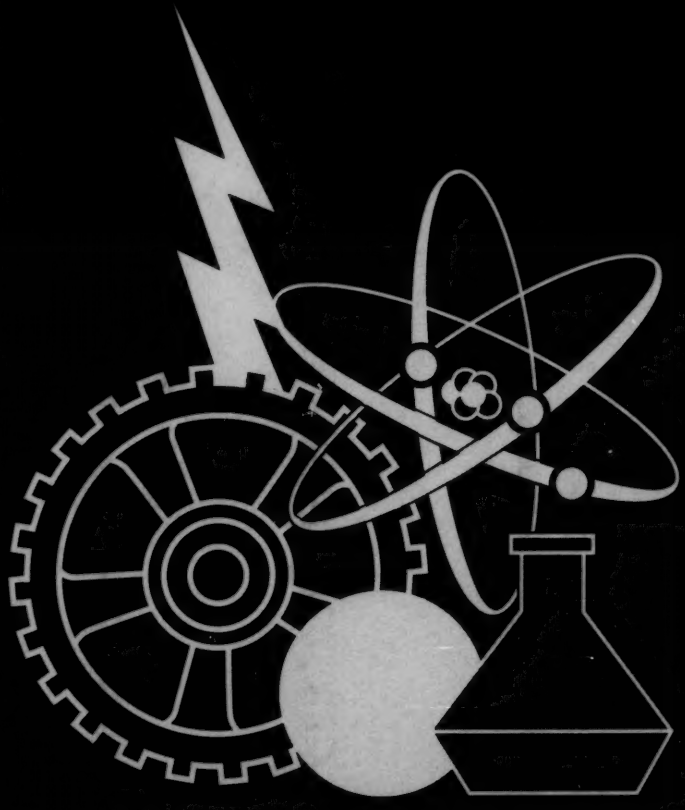
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

oute to:

PATENTS

September 29, 1992



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

September 29, 1992 Volume 1142 Number 5

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on January 1, 1992, due to a decision of the Assembly of the PCT Union taken during its meeting from 23 September 1991 to 02 October 1991, and were announced in the *Official Gazette* at 1133 O.G. 98, on Dec. 24, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Dec. 16, 1991 and were announced in the *Official Gazette* at 1133 O.G. 43 on Dec. 17, 1991.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	190.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	600.00
—Corresponding prior U.S. national application filed	400.00
—Supplemental search fee, per additional invention	160.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	440.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	650.00
—Additional examination fee, per additional invention	220.00
International fees	
Basic fee	525.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	127.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	161.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	310.00	620.00
USPTO was ISA but not IPEA	345.00	690.00
USPTO was neither ISA nor IPEA	460.00	920.00
Filing with an EPO or JPO search report	400.00	800.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	36.00	72.00
—For each claim in excess of 20	10.00	20.00
—For each application containing a multiple dependent claim	110.00	220.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 18, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Patent Cooperation Treaty Update
Ratification by Ireland

The United States Patent and Trademark Office has received notification from the World Intellectual Property Organization that Ireland deposited its instrument of ratification to the Patent Cooperation Treaty (PCT) on 01 May 1992. Ireland became the 50th Contracting State of the PCT on 01 August 1992. Consequently, nationals and residents of Ireland are entitled to file international applications on and after 01 August 1992, and from the same date it is possible to file international applications designating Ireland. The designation of Ireland has the effect of an indication of the wish to obtain a European patent for Ireland under the European Patent Convention (EPC); a national (Irish) patent cannot be obtained through an international application.

Accession by Portugal

The Uinted States Patent and Trademark Office has received notification from the World Intellectual Property Organization that Portugal deposited its instrument of accession to the Patent Cooperation Treaty (PCT) on 24 August 1992. Portugal will become the 51st Contracting State of the PCT on 24 November 1992. Consequently, nationals and residents of Portugal are entitled to file international applications on and after 24 November 1992, and from the same date it is possible to file international applications designating Portugal.

Accession by New Zealand

The United States Patent and Trademark Office has received notification from the World Intellectual Property Organization that New Zealand deposited its instrument of accession to the Patent Cooperation Treaty (PCT) on 01 September 1992. New Zealand will become the 52nd Contracting State of the PCT on 01 December 1992. Consequently, nationals and residents of New Zealand are entitled to file international applications on and after 01 December 1992, and from that date it is possible to file international applications designating New Zealand.

Listing of PCT Member Countries

	Country	Ratification or Accession		Date of Ratification or Accession		Effective Date
(1)	Central African Republic*	Accession	15	September 1971	01	June 1978
(2)	Senegal*	Ratification	08	March 1972	01	June 1978
(3)	Madagascar	Ratification	27	March 1972	01	June 1978
(4)	Malawi	Accession	16	May 1972	01	June 1978
(5)	Cameroon*	Accession	15	March 1973	01	June 1978
(6)	Chad*	Accession	12	February 1974	01	June 1978
(7)	Togo*	Ratification	28	January 1975	01	June 1978
(8)	Gabon*	Accession	06	March 1975	01	June 1978
(9)	United States of America	Ratification	26	November 1975	01	June 1978
(10)	Germany, Federal Republic of**	Ratification	19	July 1976	01	June 1978
(11)	Congo*	Accession	08	August 1977	01	June 1978
(12)	Switzerland**	Ratification	14	September 1977	01	June 1978
(13)	United Kingdom**	Ratification	24	October 1977	01	June 1978
(14)	France**	Ratification	25	November 1977	01	June 1978
(15)	Russian Federation	Ratification	29	December 1977	01	June 1978
(16)	Brazil	Ratification	09	January 1978	01	June 1978
(17)	Luxembourg**	Ratification	31	January 1978	01	June 1978
(18)	Sweden**	Ratification	17	February 1978	01	June 1978
(19)	Japan	Ratification	01	July 1978	01	October 1978
(20)	Denmark**	Ratification	01	September 1978	01	December 1978
(21)	Austria**	Ratification	23	January 1979	23	April 1979
(22)	Monaco	Ratification	22	March 1979	22	June 1979
(23)	Netherlands**	Ratification	10	April 1979	10	July 1979
(24)	Romania	Accession	23	April 1979	23	July 1979
(25)	Norway	Ratification	01	October 1979	01	January 1980
(26)	Liechtenstein**	Accession	19	December 1979	19	March 1980
(27)	Australia	Accession	31	December 1979	31	March 1980
(28)	Hungary	Ratification	27	March 1980	27	June 1980
(29)	Democratic People's Republic of Korea (North Korea)	Accession	08	April 1980	08	July 1980
(30)	Finland	Ratification	01	July 1980	01	October 1980
(31)	Belgium**	Ratification	14	September 1981	14	December 1981
(32)	Sri Lanka	Accession	26	November 1981	26	February 1982
(33)	Mauritania*	Accession	13	January 1983	13	April 1983
(34)	Sudan	Accession	16	January 1984	16	April 1984
(35)	Bulgaria	Accession	21	February 1984	21	May 1984
(36)	Republic of Korea (South Korea)	Accession	10	May 1984	10	August 1984
(37)	Mali*	Accession	19	July 1984	19	October 1984
(38)	Barbados	Accession	12	December 1984	12	March 1985
(39)	Italy**	Ratification	28	December 1984	28	March 1985
(40)	Benin*	Accession	26	November 1986	26	February 1987
(41)	Burkina Faso*	Accession	21	December 1988	21	March 1989
(42)	Spain**	Accession	16	August 1989	16	November 1989
(43)	Canada	Ratification	02	October 1989	02	January 1990
(44)	Greece**	Accession	09	July 1990	09	October 1990
(45)	Poland	Accession	25	September 1990	25	December 1990
(46)	Cote d'Ivoire*	Ratification	31	January 1991	30	April 1991
(47)	Guinea*	Accession	27	February 1991	27	May 1991
(48)	Mongolia	Accession	27	February 1991	27	May 1991
(49)	Czechoslovakia	Accession	20	March 1991	20	June 1991
(50)	Ireland**	Ratification	01	May 1992	01	August 1992
(51)	Portugal**	Accession	24	August 1992	24	November 1992
(52)	New Zealand	Accession	01	September	01	December 1992

*Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI countries. A designation of any country is an indication that all OAPI countries have been designated. Only one designation fee is due regardless of the number of OAPI member countries designated.

**Member of European Patent Convention (EPC) regional patent system. Either national or European patents for member countries are available through PCT, except for France, Belgium, Italy, Ireland and Greece for which only European patents are available if PCT is used. Note: Only one PCT designation fee is due if European regional patent protection is sought for one, several or all EPC member countries under the PCT.

Sept. 4, 1992

DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the mainte-

nance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on September 26, 1989 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,868,925 through 4,870,704
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 24, 1985 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,542,537 through 4,543,666
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Dec. 16, 1991, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9f) $450.00
By other than a small entity $900.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9f) $905.00
By other than a small entity $1,810.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§1.9(f)) $1,365.00
By other than a small entity $2,730.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity ($1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable $600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 26,1992
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,461,047	06/391,126	7/24/84
4,461,048	06/376,404	7/24/84
4,461,052	06/423,675	7/24/84
4,461,054	06/328,585	7/24/84
4,461,055	06/393,681	7/24/84
4,461,058	06/377,273	7/24/84
4,461,059	06/362,222	7/24/84
4,461,061	06/372,670	7/24/84
4,461,062	06/406,045	7/24/84
4,461,064	06/324,857	7/24/84
4,461,066	06/444,650	7/24/84
4,461,068	06/397,032	7/24/84
4,461,075	06/393,918	7/24/84
4,461,077	06/432,636	7/24/84
4,461,080	06/293,154	7/24/84
4,461,097	06/336,053	7/24/84
4,461,106	06/376,081	7/24/84
4,461,107	06/412,029	7/24/84
4,461,133	06/403,711	7/24/84
4,461,118	06/299,596	7/24/84
4,461,123	06/335,666	7/24/84
4,461,124	06/352,729	7/24/84
4,461,125	06/284,971	7/24/84
4,461,127	06/340,130	7/24/84
4,461,130	06/268,598	7/24/84
4,461,133	06/343,844	7/24/84
4,461,134	06/280,803	7/24/84
4,461,135	06/317,451	7/24/84
4,461,138	06/451,449	7/24/84
4,461,139	06/393,186	7/24/84
4,461,145	06/433,561	7/24/84
4,461,146	06/436,091	7/24/84
4,461,147	06/315,381	7/24/84
4,461,150	06/350,872	7/24/84
4,461,154	06/388,375	7/24/84
4,461,156	06/324,405	7/24/84
4,461,157	06/345,293	7/24/84
4,461,161	06/535,537	7/24/84
4,461,163	06/436,272	7/24/84
4,461,167	06/308,747	7/24/84
4,461,168	06/400,693	7/24/84
4,461,169	06/429,677	7/24/84
4,461,170	06/440,346	7/24/84
4,461,171	06/457,716	7/24/84
4,461,174	06/396,014	7/24/84
4,461,180	06/342,731	7/24/84
4,461,184	06/396,189	7/24/84
4,461,188	06/333,848	7/24/84
4,461,190	06/325,985	7/24/84
4,461,191	06/463,415	7/24/84
4,461,196	06/428,135	7/24/84
4,461,198	06/548,229	7/24/84
4,461,204	06/286,112	7/24/84
4,461,207	06/462,638	7/24/84
4,461,216	06/425,450	7/24/84
4,461,218	06/290,314	7/24/84
4,461,220	06/357,816	7/24/84
4,461,223	06/533,724	7/24/84
4,461,224	06/349,390	7/24/84
4,461,227	06/303,689	7/24/84
4,461,235	06/516,122	7/24/84
4,461,236	06/446,392	7/24/84

Patent Number	Serial Number	Issue Date
4,461,247	06/419,698	7/24/84
4,461,253	06/418,532	7/24/84
4,461,254	06/403,183	7/24/84
4,461,259	06/549,013	7/24/84
4,461,262	06/225,786	7/24/84
4,461,263	06/442,578	7/24/84
4,461,273	06/271,853	7/24/84
4,461,277	06/466,663	7/24/84
4,461,294	06/340,978	7/24/84
4,461,295	06/544,283	7/24/84
4,461,305	06/299,559	7/24/84
4,461,306	06/502,863	7/24/84
4,461,307	06/393,079	7/24/84
4,461,314	06/416,836	7/24/84
4,461,317	06/251,647	7/24/84
4,461,328	06/385,018	7/24/84
4,461,331	06/417,145	7/24/84
4,461,336	06/296,544	7/24/84
4,461,340	06/475,744	7/24/84
4,461,341	06/359,027	7/24/84
4,461,347	06/228,739	7/24/84
4,461,349	06/446,901	7/24/84
4,461,350	06/331,425	7/24/84
4,461,351	06/470,752	7/24/84
4,461,352	06/470,753	7/24/84
4,461,357	06/359,782	7/24/84
4,461,359	06/371,097	7/24/84
4,461,362	06/427,427	7/24/84
4,461,363	06/401,680	7/24/84
4,461,368	06/368,749	7/24/84
4,461,370	06/512,747	7/24/84
4,461,374	06/281,253	7/24/84
4,461,378	06/285,066	7/24/84
4,461,380	06/309,704	7/24/84
4,461,381	06/361,712	7/24/84
4,461,383	06/394,792	7/24/84
4,461,384	06/392,160	7/24/84
4,461,386	06/263,123	7/24/84
4,461,389	06/438,602	7/24/84
4,461,396	06/450,159	7/24/84
4,461,400	06/297,606	7/24/84
4,461,409	06/502,173	7/24/84
4,461,410	06/336,947	7/24/84
4,461,411	06/518,117	7/24/84
4,461,414	06/495,760	7/24/84
4,461,420	06/436,181	7/24/84
4,461,427	06/347,814	7/24/84
4,461,434	06/375,821	7/24/84
4,461,435	06/393,455	7/24/84
4,461,436	06/332,954	7/24/84
4,461,440	06/468,074	7/24/84
4,461,443	06/320,770	7/24/84
4,461,450	06/392,322	7/24/84
4,461,452	06/256,681	7/24/84
4,461,458	06/448,315	7/24/84
4,461,462	06/442,438	7/24/84
4,461,469	06/349,623	7/24/84
4,461,470	06/505,876	7/24/84
4,461,474	06/495,044	7/24/84
4,461,476	06/247,239	7/24/84
4,461,478	06/388,280	7/24/84
4,461,479	06/353,581	7/24/84
4,461,480	06/430,316	7/24/84
4,461,485	06/345,563	7/24/84
4,461,492	06/363,575	7/24/84
4,461,500	06/369,766	7/24/84
4,461,501	06/261,016	7/24/84
4,461,503	06/418,249	7/24/84
4,461,511	06/260,927	7/24/84
4,461,514	06/533,652	7/24/84
4,461,515	06/334,781	7/24/84
4,461,516	06/414,992	7/24/84
4,461,519	06/311,120	7/24/84
4,461,522	06/410,236	7/24/84
4,461,523	06/326,242	7/24/84
4,461,530	06/419,669	7/24/84
4,461,534	06/440,701	7/24/84
4,461,535	06/313,603	7/24/84
4,461,536	06/300,956	7/24/84
4,461,538	06/312,999	7/24/84
4,461,541	06/362,015	7/24/84
4,461,546	06/391,574	7/24/84
4,461,548	06/254,144	7/24/84
4,461,553	06/389,807	7/24/84
4,461,557	06/421,054	7/24/84
4,461,561	06/403,807	7/24/84
4,461,566	06/448,765	7/24/84
4,461,567	06/426,111	7/24/84
4,461,569	06/337,621	7/24/84
4,461,570	06/386,488	7/24/84
4,461,573	06/378,494	7/24/84
4,461,575	06/303,181	7/24/84
4,461,580	06/263,019	7/24/84
4,461,590	06/315,220	7/24/84
4,461,593	06/360,014	7/24/84
4,461,598	06/346,739	7/24/84
4,461,601	06/337,804	7/24/84
4,461,603	06/359,821	7/24/84
4,461,609	06/381,035	7/24/84
4,461,610	06/396,491	7/24/84
4,461,617	06/436,299	7/24/84
4,461,623	06/420,976	7/24/84
4,461,625	06/218,637	7/24/84
4,461,638	06/484,024	7/24/84
4,461,640	06/383,323	7/24/84
4,461,652	06/417,216	7/24/84
4,461,653	06/457,134	7/24/84
4,461,655	06/469,128	7/24/84
4,461,656	06/475,490	7/24/84
4,461,661	06/332,197	7/24/84
4,461,663	06/326,500	7/24/84
4,461,664	06/428,147	7/24/84
4,461,669	06/537,982	7/24/84
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4,760,548	06/873,902	7/26/88
4,760,558	06/742,617	7/26/88
4,760,581	06/860,818	7/26/88
4,760,585	06/936,814	7/26/88
4,760,589	06/853,940	7/26/88
4,760,590	07/110,576	7/26/88
4,760,594	07/093,015	7/26/88
4,760,607	06/891,311	7/26/88

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,218,690, Re. S.N. 07/930,855, Filed Aug. 14, 1992, Cl. 346/149, SELF-CONTAINED PROGRAMMABLE TERMINAL FOR SECURITY SYSTEMS, Bryan D. Ulch, et. al., Owner of Record: *Casi-Rusco, Inc., Boca Raton, Fla.,* Attorney or Agent: John C. Lambertsen, Ex. Gp.: 2604

4,497,015, Re. S.N. 07/924,789, Filed Aug. 6, 1992, Cl. 362, LIGHT ILLUMINATION DEVICE, Kunio Konno, et. al., Owner of Record: *Nikon Corp., Tokyo, Japan,* Attorney or Agent: John R. Inge, Ex. Gp.: 2201

4,710,008, Re. S.N. 07/836,816, Filed Feb. 19, 1992, Cl. 354/289.1, CAMERA WITH OPERATION SWITCH, Yoichi Tosaka, et. al., Owner of Record: *Cannon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Anthony M. Zupcic, Ex. Gp.: 2101

4,888,500, Re. S.N. 07/810,682, Filed Dec. 19, 1991, Cl. 307/475, TTL-COMPATIBLE CELL FOR CMOS INTERGRATED CIRCUITS, German Nicollini, et. al., Owner of Record: *SGS-Thompson Microelectronics, SPA, Catinia, Italy,* Attorney or Agent: Kenneth C. Hill, Ex. Gp.: 2509

4,908,937, Re. S.N. 07/855,086, Filed Mar. 20, 1992, Cl. 29/840, METHOD TO INSTALL AN ELECTRONIC COMPONENT AND ITS ELECTRICAL CONNECTIONS ON A SUPPORT, AND PRODUCT OBTAINED THEREBY, Jean-Pierre Gloton, et. al., Owner of Record: *SGS Thompson Microelectronics, S.A., Gentilly, France,* Attorney or Agent: Kenneth C. Hill, Ex. Gp.: 3206

4,940,410, Re. S.N. 07/910,603, Filed July 8, 1992, Cl. 433/102, DENTAL TOOL HOLDER, Marc Francois Charles Apap, et. al., Owner of Record: *Dentalwerk Burmoos Gesellschaft, Burmoos, Austria,* Attorney or Agent: David Toren, Ex. Gp.: 3303

4,979,303, Re. S.N. 07/896,541, Filed Nov. 12, 1991, Cl. 30/210, SELF HAIR CUTTING DEVICE, Sherwin X. Han, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 3204

5,051,002, Re. S.N. 07/931,877, Filed Aug. 18, 1992, Cl. 384/49, GUIDE SLEEVE, GUIDE POST AND MODIFIED BALL BEARING ASSEMBLY, Ronald L. Hanaway, Owner of Record: *Inventor,* Attorney or Agent: Theodore W. Olds, Ex. Gp.: 2405

5,051,940, Re. S.N. 07/931,624, Filed Aug. 18, 1992, Cl. 364/736, DATA DEPENDENCY COLLASPING HARDWARE APPARATUS, Stamatis Vassiliadis, et. al., Owner of Record: *International Bussiness Machines Corp., Armonk, N.Y.,* Attorney or Agent: Terrance A. Meader, Ex. Gp.: 2306

5,054,937, Re. S.N. 07/931,610, Filed Aug. 18, 1992, Cl. 384/49, GUIDE SLEEVE, GUIDE POST AND BALL BEARING ASSEMBLY WITH ROLLER PLUG, Ronald L. Hanaway, Owner of Record: *Inventor,* Attorney or Agent: Theodore W. Olds, Ex. Gp.: 2405

5,096,307, Re. S.N. 07/931,876, Filed Aug. 18, 1992, Cl. 384/49, GUIDE SLEEVE GUIDE POST AND IMPROVED BALL BEARING ASSEMBLY, Ronald L. Hanaway, Owner of Record: *Inventor,* Attorney or Agent: Theodore W. Olds, Ex. Gp.: 2405

5,101,939, Re. S.N. 07/904,248, Filed June 25, 1992, Cl. 188/171, DISK BRAKE FOR ELEVATOR, William Sheridan, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 3103

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,246,102, Reexam. No. 90/002,817, Requested Aug. 14, 1992, Cl. 210/702, METHOD FOR SEPARATING POLLUTANTS FROM LIQUID, Ulf R. Hjelmner, et. al., Owner of Record: *Rederiaktiebolaget Nordstjernan, Stockholm, Sweden,* Attorney or Agent: Brumbaugh, Graves, Donohue & Raymond, New York, N.Y., Ex. Gp.: 1308, Requester: Irving Powers, St. Louis, Mo.

4,642,666, Reexam. No. 90/002,818, Requested Aug. 24, 1992, Cl. 357/23.4, HIGH POWER MOSFET WITH LOW ON

RESISTANCE AND HIGH BREAKDOWN VOLTAGE, Alexander Lidow, et. al., Owner of Record: *International Rectifier Corp., Los Angeles, Calif.*, Attorney or Agent: Samuel H. Weiner, Ostrolenk, Faber, Gerb & Soffen, New York, N.Y., Ex. Gp.: 2508, Requester: SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

4,826,712, Reexam. No. 90/002,819, Requested Aug. 24, 1992, Cl. 428/004, DECORATIVE RIBBONS, Mark H. Theno, Owner of Record: *Inventor*, Eden Prairie, Minn., Attorney or Agent: Carl L. Johnson, Jacobson & Johnson, St. Paul, Minn., Ex. Gp.: 1508, Requester: Leland D. Schultz, St. Paul, Minn.

5,045,016, Reexam. No. 90/002,820, Requested Aug. 25, 1992, Cl. 446/409, TOY VEHICLE WITH ELECTRONIC SOUNDER AND DIRECTION SENSOR, Carl M. Stern, et. al., Owner of Record: *Innova Development Corp., Pennington, N.J.*, Attorney or Agent: Norman E. Lehrer, Cherry Hill, N.J., Ex. Gp.: 3301, Requester: William H. Meserole, Dennison, Meserole, Pollack & Scheiner, Arlington, Va.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

PR Products, Ltd., Denver, Colo., Reg. No. 1,413,900 for the mark "SHAMPAGNE AND DESIGN", Canc. No. 20,541.

Containwares, Inc., Costa Mesa, Calif., Reg. No. 1,573,967, for the mark "CONTAINWARES AND DESIGN", Canc. No. 20,591.

Marketing & Distribution, Resources, Inc., Waltham, Mass., Reg. No. 973,075 for the mark "MDR AND DESIGN", Canc. No. 20,634.

Kenneth Carl Johnson, Carmichael, Calif., Reg. No. 1,450,965 for the mark "ALL STAR FACE-OFF", Canc. No. 20,605.

The Catamore Company, East Providence, R.I., Reg. No. 1,057,519 for the mark "CONTESSA AND DESIGN", Canc. No. 20,274.

Edwin A. Moll and Associates, Ltd., Glenview, Ill., Reg. No. 1,650,068 for the mark "CRYSTAL-PURE SYSTEMS AND DESIGN", Canc. No. 20,709.

Aprim, Inc., Frankenmuth, Mich., Reg. No. 1,626,630 for the mark "APRIM", Canc. No. 20,711.

Decks, Inc., Arlington Heights, Ill., Reg. No. 1,507,097 for the mark "BUSINESS RESOURCE", Canc. No. 20,660.

Discovery Airways, Inc., Honolulu, Hi., Reg. No. 1,635,029 for the mark "DISCOVERY AIRWAYS", Canc. No. 20,678.

Empire Systems, Inc., Los Angeles, Calif., Reg. No. 958,597 for the mark "EASY RITER", Canc. No. 20,360.

JEAN BROWN
Administrator, Trademark
Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner
for Trademarks

Reclassification Alert Report

This report is a summary of classification changes which became effective by issuance of Classification Orders from July through September 1992. Information includes:

- o subclasses established or abolished (major changes)
- o subclass title, indent, or position change
- o definitions changes to existing classes and subclass definitions (minor changes)

This Reclassification Alert Report may appear from time to time in the *Official Gazette* and is intended to provide an interim notice of classification and changes pending publication of the Manual of Classification and revisions thereto.

Sept. 1, 1992

WILLIAM S. LAWSON
Administrator for Search and
Information Resources

Reclassification Alert Report
July 1992-September 1992

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
PLT	007	008	ABOLISH	1414
PLT	007.1		ESTABLISH	1414
PLT	008.1	008.2	ESTABLISH	1414
PLT	010.1		ESTABLISH	1414
PLT	030		ABOLISH	1414
PLT	030.1		ESTABLISH	1414
PLT	032.2		ESTABLISH	1414
PLT	033	034	ABOLISH	1414
PLT	033.1		ESTABLISH	1414
PLT	034.1		ESTABLISH	1414
PLT	035.1	035.2	ESTABLISH	1414
PLT	038		ABOLISH	1414
PLT	038.1	038.2	ESTABLISH	1414
PLT	040	043	ABOLISH	1414
PLT	040.1		ESTABLISH	1414
PLT	041.1	041.4	ESTABLISH	1414

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
PLT	042.1		ESTABLISH	1414
PLT	043.1	043.3	ESTABLISH	1414
PLT	046	047	ABOLISH	1414
PLT	046.1	046.2	ESTABLISH	1414
PLT	047.1	047.3	ESTABLISH	1414
PLT	049.1		ESTABLISH	1414
PLT	050	051	ABOLISH	1414
PLT	050.1	050.3	ESTABLISH	1414
PLT	051.1		ESTABLISH	1414
PLT	053.1	053.7	ESTABLISH	1414
PLT	054		ABOLISH	1414
PLT	054.1		ESTABLISH	1414
PLT	067.1	067.8	ESTABLISH	1414
PLT	068	075	ABOLISH	1414
PLT	068.1		ESTABLISH	1414
PLT	069.1	069.2	ESTABLISH	1414
PLT	070.1	070.7	ESTABLISH	1414
PLT	071.1		ESTABLISH	1414
PLT	072.1		ESTABLISH	1414
PLT	073.1	073.3	ESTABLISH	1414
PLT	074.1		ESTABLISH	1414
PLT	082.1	082.5	ESTABLISH	1414
PLT	086		ABOLISH	1414
PLT	086.1	086.4	ESTABLISH	1414
PLT	087.1		ESTABLISH	1414
PLT	087.11	087.18	ESTABLISH	1414
PLT	087.2	087.9	ESTABLISH	1414
PLT	088	089	ABOLISH	1414
PLT	088.1		ESTABLISH	1414
PLT	088.11		ESTABLISH	1414
PLT	088.2	088.9	ESTABLISH	1414
PLT	090		ESTABLISH	1414
PLT	090.1	090.2	ESTABLISH	1414
PLT	095		ESTABLISH	1414
PLT	100		ESTABLISH	1414
002			DEFN CHANGE	1413
002			DEFN CHANGE	1415
004			DEFN CHANGE	1415
004			DEFN CHANGE	1421
007			DEFN CHANGE	1415
015			DEFN CHANGE	1425
015	104		ABOLISH	1415
015	104.001	104.002	ESTABLISH	1415
015	104.095	104.096	ESTABLISH	1415
015	104.1		ABOLISH	1415
015	119		ABOLISH	1415
015	119.1	119.2	ESTABLISH	1415
015	120		ABOLISH	1415
015	120.1	120.2	ESTABLISH	1415
015	143		ABOLISH	1415
015	143.1		ESTABLISH	1415
015	144		ABOLISH	1415
015	144.1	144.4	ESTABLISH	1415
015	147		ABOLISH	1415
015	147.1	147.2	ESTABLISH	1415
015	154.2		ESTABLISH	1415
015	159		ABOLISH	1415
015	159.1		ESTABLISH	1415
015	191		ABOLISH	1415
015	191.1		ESTABLISH	1415
015	205.2		ESTABLISH	1415
015	207.2		ESTABLISH	1415
015	209		ABOLISH	1415
015	209.1		ESTABLISH	1415
015	210		ABOLISH	1415
015	210.1		ESTABLISH	1415
015	220		ABOLISH	1415
015	220.1	220.4	ESTABLISH	1415
015	229.11	229.14	ESTABLISH	1415
015	245.1		ESTABLISH	1415
015	246.2	246.4	ESTABLISH	1415
015	248		ABOLISH	1415
015	248.2		ESTABLISH	1415
015	250		ABOLISH	1415
015	250.001	250.003	ESTABLISH	1415
015	257		ABOLISH	1415

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
015	257.01		ESTABLISH	1415
015	DIG. 14	DIG. 15	ESTABLISH	1415
016			DEFN CHANGE	1415
024			DEFN CHANGE	1413
024			DEFN CHANGE	1417
030			DEFN CHANGE	1415
033			DEFN CHANGE	1413
033			DEFN CHANGE	1426
034			DEFN CHANGE	1415
034			DEFN CHANGE	1418
036	050		ABOLISH	1417
036	050.1		ESTABLISH	1417
036	050.5		ESTABLISH	1417
040			DEFN CHANGE	1416
043			DEFN CHANGE	1413
043			DEFN CHANGE	1415
049			DEFN CHANGE	1417
049			DEFN CHANGE	1421
052			DEFN CHANGE	1415
053			DEFN CHANGE	1416
054	001		TITLE CHANGE	1413
054	006		ABOLISH	1413
054	006.1	006.2	ESTABLISH	1413
054	018		ABOLISH	1413
054	018.1	018.3	ESTABLISH	1413
054	019		ABOLISH	1413
054	019.1	019.3	ESTABLISH	1413
054	037	046	ABOLISH	1413
054	037.1		ESTABLISH	1413
054	038.1		ESTABLISH	1413
054	039.1		ESTABLISH	1413
054	040.1		ESTABLISH	1413
054	041.1		ESTABLISH	1413
054	042.1		ESTABLISH	1413
054	043.1		ESTABLISH	1413
054	044.1	044.7	ESTABLISH	1413
054	045.1		ESTABLISH	1413
054	046.1	046.2	ESTABLISH	1413
054	079	081	ABOLISH	1413
054	079.1	079.4	ESTABLISH	1413
054	080.1	080.5	ESTABLISH	1413
054	083		ABOLISH	1413
054	083.1	083.2	ESTABLISH	1413
056			DEFN CHANGE	1415
062			DEFN CHANGE	1421
068			DEFN CHANGE	1423
073	054.16		TITLE CHANGE	1422
073	064.47		TITLE CHANGE	1422
073	622		TITLE CHANGE	1422
073	641		TITLE CHANGE	1422
073	820		TITLE CHANGE	1422
073	862.04		ABOLISH	1422
073	862.041	862.046	ESTABLISH	1422
073	862.19		ABOLISH	1422
073	862.191	862.195	ESTABLISH	1422
073	862.32	862.36	ABOLISH	1422
073	862.321	862.329	ESTABLISH	1422
073	862.331	862.339	ESTABLISH	1422
073	862.38	862.39	ABOLISH	1422
073	862.381	862.382	ESTABLISH	1422
073	862.391	862.393	ESTABLISH	1422
073	862.45		ABOLISH	1422
073	862.451	862.454	ESTABLISH	1422
073	862.47	862.48	ABOLISH	1422
073	862.471	862.474	ESTABLISH	1422
073	862.54		ABOLISH	1422
073	862.541	862.543	ESTABLISH	1422
073	862.58		ABOLISH	1422
073	862.581	862.584	ESTABLISH	1422
073	862.62	862.67	ABOLISH	1422
073	862.621	862.629	ESTABLISH	1422
073	862.631	862.639	ESTABLISH	1422
073	862.641	862.642	ESTABLISH	1422
081			DEFN CHANGE	1415
086			DEFN CHANGE	1423
091			DEFN CHANGE	1427

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
092			DEFN CHANGE	1427
099			DEFN CHANGE	1425
100			DEFN CHANGE	1418
100			DEFN CHANGE	1425
102			DEFN CHANGE	1425
108			DEFN CHANGE	1421
112			DEFN CHANGE	1413
116			DEFN CHANGE	1426
128			DEFN CHANGE	1415
128			DEFN CHANGE	1426
132			DEFN CHANGE	1415
132			DEFN CHANGE	1421
134	094	103	ABOLISH	1423
134	094.1		ESTABLISH	1423
134	095.1	095.3	ESTABLISH	1423
134	096.1		ESTABLISH	1423
134	097.1		ESTABLISH	1423
134	098.1		ESTABLISH	1423
134	099.1	099.2	ESTABLISH	1423
134	100.1		ESTABLISH	1423
134	102.1	102.3	ESTABLISH	1423
134	103.1	103.3	ESTABLISH	1423
135			DEFN CHANGE	1413
137			DEFN CHANGE	1415
150			DEFN CHANGE	1421
162	125		TITLE CHANGE	1418
162	357		TITLE CHANGE	1418
162	358		ABOLISH	1418
162	358.1	358.5	ESTABLISH	1418
162	359		ABOLISH	1418
162	359.1		ESTABLISH	1418
162	360.1		ABOLISH	1418
162	360.2	360.3	ESTABLISH	1418
162	411		TITLE CHANGE	1418
162	900	904	ESTABLISH	1418
162	DIG. 01		ABOLISH	1418
166			DEFN CHANGE	1415
177			DEFN CHANGE	1422
180			DEFN CHANGE	1415
188			DEFN CHANGE	1424
202			DEFN CHANGE	1415
206			DEFN CHANGE	1425
206	459		ABOLISH	1416
206	459.1		ESTABLISH	1416
206	459.5		ESTABLISH	1416
211			DEFN CHANGE	1421
219			DEFN CHANGE	1415
220	091	096	ABOLISH	1425
220	212.5		ESTABLISH	1425
220	578	580	ESTABLISH	1425
220	710.5		ESTABLISH	1425
220	751	776	ESTABLISH	1425
221			DEFN CHANGE	1421
221			DEFN CHANGE	1425
222			DEFN CHANGE	1415
222			DEFN CHANGE	1425
225			DEFN CHANGE	1415
225			DEFN CHANGE	1421
226			DEFN CHANGE	1421
235			DEFN CHANGE	1415
239			DEFN CHANGE	1415
242			DEFN CHANGE	1421
248			DEFN CHANGE	1421
261	122		ABOLISH	1419
261	122.1	122.2	ESTABLISH	1419
267	140.1		ABOLISH	1424
267	140.11	140.15	ESTABLISH	1424
273	164		ABOLISH	1426
273	164.1	164.2	ESTABLISH	1426
273	183		ABOLISH	1426
273	183.1		ESTABLISH	1426
273	186		ABOLISH	1426
273	186.1	186.5	ESTABLISH	1426
273	187.1	187.6	ESTABLISH	1426
273	282		ABOLISH	1426
273	282.1	282.3	ESTABLISH	1426

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
294			DEFN CHANGE	1415
294			DEFN CHANGE	1425
297			DEFN CHANGE	1413
297	264		TITLE CHANGE	1420
297	281		TITLE CHANGE	1420
297	283		TITLE CHANGE	1420
297	284		ABOLISH	1420
297	284.1		ESTABLISH	1420
297	284.11		ESTABLISH	1420
297	284.2	284.9	ESTABLISH	1420
297	309		TITLE CHANGE	1420
297	31		TITLE CHANGE	1420
297	321		TITLE CHANGE	1420
297	410		TITLE CHANGE	1420
297	457		TITLE CHANGE	1420
297	83		TITLE CHANGE	1420
312			DEFN CHANGE	1416
312			DEFN CHANGE	1425
312	007.2		TITLE CHANGE	1421
312	008	020	ABOLISH	1421
312	008.1		ESTABLISH	1421
312	008.11	008.16	ESTABLISH	1421
312	008.2	008.9	ESTABLISH	1421
312	009.1		ESTABLISH	1421
312	009.11	009.19	ESTABLISH	1421
312	009.2		ESTABLISH	1421
312	009.21	009.29	ESTABLISH	1421
312	009.3		ESTABLISH	1421
312	009.31	009.38	ESTABLISH	1421
312	009.4		ESTABLISH	1421
312	009.41	009.48	ESTABLISH	1421
312	009.5		ESTABLISH	1421
312	009.51	009.59	ESTABLISH	1421
312	009.6		ESTABLISH	1421
312	009.61		ESTABLISH	1421
312	009.63		ESTABLISH	1421
312	009.64		ESTABLISH	1421
312	009.7	009.9	ESTABLISH	1421
312	010.1		ESTABLISH	1421
312	034.1		ESTABLISH	1421
312	034.11	034.19	ESTABLISH	1421
312	034.2		ESTABLISH	1421
312	034.21	034.24	ESTABLISH	1421
312	034.3	034.9	ESTABLISH	1421
312	037	041	ABOLISH	1421
312	193.4		ESTABLISH	1421
312	208		ABOLISH	1421
312	208.1	208.6	ESTABLISH	1421
312	223		ABOLISH	1421
312	223.1	223.6	ESTABLISH	1421
312	228.1		ESTABLISH	1421
312	249	256	ABOLISH	1421
312	249.1		ESTABLISH	1421
312	249.11	249.13	ESTABLISH	1421
312	249.2	249.9	ESTABLISH	1421
312	319	320	ABOLISH	1421
312	319.1	319.9	ESTABLISH	1421
312	332.1		ESTABLISH	1421
312	334	348	ABOLISH	1421
312	334.1		ESTABLISH	1421
312	334.11	334.19	ESTABLISH	1421
312	334.2		ESTABLISH	1421
312	334.21	334.29	ESTABLISH	1421
312	334.3		ESTABLISH	1421
312	334.31	334.39	ESTABLISH	1421
312	334.4		ESTABLISH	1421
312	334.41	334.47	ESTABLISH	1421
312	334.5	334.9	ESTABLISH	1421
312	348.6		ESTABLISH	1421
312	351.1		ESTABLISH	1421
312	351.11	351.14	ESTABLISH	1421
312	351.2	351.9	ESTABLISH	1421
312	410		ESTABLISH	1421
312	901	902	ESTABLISH	1421
312	DIG. 33		ABOLISH	1421
322			DEFN CHANGE	1422

FIRST CLASS	LAST SUBCLASS	SUBCLASS	ORDER ACTION	NUMBER
324			DEFN CHANGE	1422
338			DEFN CHANGE	1422
340			DEFN CHANGE	1422
352			DEFN CHANGE	1421
353			DEFN CHANGE	1421
354			DEFN CHANGE	1421
354			DEFN CHANGE	1423
356			DEFN CHANGE	1421
362			DEFN CHANGE	1421
362			DEFN CHANGE	1425
369			DEFN CHANGE	1421
383			DEFN CHANGE	1416
384			DEFN CHANGE	1421
401			DEFN CHANGE	1415
401			DEFN CHANGE	1425
403			DEFN CHANGE	1415
417	222		ABOLISH	1427
417	222.1	222.2	ESTABLISH	1427
417	464		TITLE CHANGE	1427
424			DEFN CHANGE	1415
493			DEFN CHANGE	1415
902			DEFN CHANGE	1421

Status of PTO Services

The following is an update of the status of PTO services for Aug. 1992:

Service Item	FY 1992 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	17
Trademarks	30	45
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	See Note
Window Coupons	5	2
Mail Coupons	12	5
Letter Orders	16	15
Electronic Ordering Service (EOS)	11	2
Certified Copies:		
Trademark Registrations	21	29
Patent Applications-As-Filed	17	16
Patent Applications Expedited	7	11
Patent File-Wrapper/Contents	N/A	19
TM Applications-As-Filed	17	13
TM Applications Expedited	7	6
Trademark Search Library:		
Filing Pending Marks	23	50
Filing Reg. Certificates	Issue Date + 2 days	Issue + 2
Filing Temp. Drawings	8	14
Assignments:		
Recording Patents-New Applications	20	32
Recording Patents-Mail Room Recpts.	20	26
Return Patents-New Applications	34	48
Return Patents-Mail Room Recpts.	34	39
Recording Trademarks	20	39
Returning Trademark Documents	34	44
Avg. Days from Issue Fee Payment to Issue Date	90-100	110
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On Time
Patent Copies Available	95% on Issue Date	99% on Issue Date

*Unless otherwise noted.
Note: Special service temporarily discontinued May 5. It was resumed on August 24 but meaningful statistics will not be available until next month.

Sept. 3, 1992

THERESA A. BRELSFORD
Assistant Commissioner for Public Services and Administration

PATENT NOTICES

Certificates of Correction For Week of September 29, 1992

D. 310,057	4,964,762	4,992,720	5,011,805
D. 313,292	4,964,776	4,993,014	5,012,024
D. 315,022	4,965,133	4,993,097	5,012,271
Re. 33,352	4,965,154	4,993,130	5,012,366
Re. 33,464	4,965,258	4,993,204	5,012,367
Re. 33,542	4,965,722	4,993,641	5,012,970
3,863,114	4,966,717	4,993,893	5,013,279
4,522,807	4,966,828	4,994,600	5,013,515
4,772,392	4,966,862	4,994,773	5,013,554
4,794,320	4,967,216	4,995,011	5,013,567
4,794,388	4,967,364	4,995,289	5,013,761
4,806,472	4,968,514	4,995,876	5,013,792
4,816,692	4,968,692	4,996,359	5,013,837
4,826,997	4,968,818	4,997,564	5,013,866
4,835,478	4,969,112	4,997,877	5,014,355
4,835,809	4,970,229	4,998,043	5,014,705
4,838,132	4,971,419	4,998,535	5,015,087
4,838,889	4,971,694	4,999,142	5,015,155
4,845,196	4,972,068	4,999,220	5,015,253
4,864,302	4,972,509	4,999,519	5,015,337
4,865,883	4,972,969	4,999,805	5,015,338
4,866,293	4,973,486	5,000,554	5,016,621
4,872,906	4,973,585	5,000,568	5,017,269
4,873,664	4,974,501	5,000,698	5,017,392
4,885,474	4,974,738	5,001,240	5,017,627
4,886,302	4,975,206	5,001,246	5,018,151
4,889,613	4,975,881	5,001,814	5,018,517
4,894,095	4,976,048	5,001,945	5,018,627
4,895,920	4,976,256	5,002,112	5,018,646
4,898,156	4,977,243	5,002,116	5,018,664
4,898,162	4,977,502	5,002,699	5,018,814
4,899,111	4,977,584	5,002,869	5,018,892
4,907,074	4,978,389	5,003,129	5,018,905
4,907,671	4,978,512	5,003,152	5,018,937
4,909,675	4,979,607	5,003,169	5,019,043
4,910,463	4,979,765	5,003,960	5,019,396
4,910,832	4,979,805	5,004,274	5,019,707
4,911,176	4,979,860	5,004,623	5,019,709
4,925,030	4,980,250	5,004,673	5,019,745
4,927,341	4,980,302	5,004,833	5,019,790
4,928,424	4,980,510	5,004,860	5,020,113
4,930,711	4,980,850	5,005,088	5,020,263
4,935,319	4,981,007	5,005,417	5,020,309
4,936,100	4,981,103	5,005,675	5,020,434
4,940,900	4,981,448	5,006,025	5,020,678
4,941,190	4,981,513	5,006,333	5,020,744
4,941,886	4,981,585	5,006,499	5,021,246
4,942,058	4,981,617	5,006,525	5,021,396
4,942,396	4,981,727	5,006,941	5,021,412
4,942,921	4,982,217	5,007,112	5,021,704
4,944,279	4,982,420	5,007,343	5,021,824
4,944,785	4,982,622	5,007,629	5,022,377
4,945,534	4,983,208	5,007,711	5,022,610
4,946,806	4,984,024	5,007,907	5,023,000
4,946,912	4,984,042	5,008,117	5,023,140
4,947,110	4,984,143	5,008,224	5,023,148
4,947,422	4,984,297	5,008,324	5,023,619
4,948,053	4,984,358	5,008,327	5,024,354
4,949,115	4,985,474	5,008,338	5,027,249
4,949,444	4,985,929	5,008,403	5,028,723
4,950,214	4,986,232	5,008,438	5,028,724
4,950,233	4,986,333	5,008,733	5,029,128
4,952,618	4,986,445	5,008,971	5,029,315
4,952,812	4,987,460	5,009,173	5,029,333
4,953,514	4,988,463	5,009,223	5,029,462
4,953,550	4,988,598	5,009,270	5,032,817
4,957,206	4,988,627	5,009,303	5,040,301
4,959,182	4,988,700	5,009,966	5,041,525
4,959,198	4,989,218	5,010,130	5,043,704
4,960,135	4,989,751	5,010,223	5,051,784
4,960,711	4,990,216	5,010,611	5,071,802
4,962,131	4,990,665	5,010,774	5,083,713
4,962,187	4,991,030	5,010,881	5,084,753
4,962,502	4,991,222	5,011,003	5,122,749
4,964,147	4,991,299	5,011,532	
4,964,365	4,992,417	5,011,572	
4,964,483	4,992,424	5,011,586	

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Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	Not Yet Operational
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	St. Louis Public Library	(314) 241-2288 Ext. 390
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	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
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PATENT EXAMINING CORPS

VACANT, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	5/23/91
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	12/18/91
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — DONALD CZAJA, Acting Director	308-0651	7/22/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	6/16/91
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Acting Director	308-0196	3/15/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	3/20/91
SPECIAL LAWS ADMINISTRATION, GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	3/16/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	6/02/90
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	8/14/91
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	308-0962	1/19/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	3/23/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	9/07/91
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	9/30/91
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	8/16/91
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	9/27/91
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-0651	7/09/91

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during August 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,897,596 to 3,902,195 inclusive
Plant Patents ..... 3,755 to 3,775

REISSUES

SEPTEMBER 29, 1992

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,078

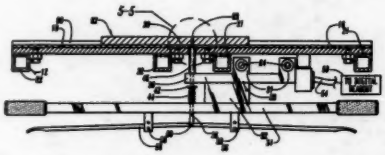
METHOD AND MEANS FOR MEASURING PLATE STRUCTURES

Dennis R. Hesseltine, 1800 Grand Ave., Apt. #235, West Des Moines, Iowa 50265

Original No. 4,969,275, dated Nov. 13, 1990, Ser. No. 482,031, Feb. 20, 1990. Application for reissue Nov. 14, 1991, Ser. No. 792,176

Int. Cl.[5] G01B *5/08*

U.S. Cl. 33—803 **11 Claims**



7. A measuring device for fabricated plate structures, comprising,

a flat table surface means, having opposite sides and ends,

a support means for such flat table surface means,

a straight reference gauge means adjacent one end of said table surface means, and extending across said table surface means at right angles to said sides,

an elongated straight slot in said table surface means extending in a direction at right angles to said gauge means,

a carriage means movably mounted below said table surface, and adapted to be moved in a direction parallel to said slot,

a retractable measuring reference pin on said carriage and extending upwardly through said slot and having an upper end normally terminating above said table surface,

and measuring means operative with the location of said pin and said gauge means to measure the linear distance between the location of said pin with respect to said gauge means so that measurements relating to the location of apertures in a plate structure with reference to one end of said plate abutted against gauge means can be determined while said pin is in its upper position and penetrating an aperture in said plate structure.

Re. 34,079

METHOD AND APPARATUS FOR CONSERVING BATTERY POWER IN A SNOWMOBILE ELECTRICAL SYSTEM

Ward K. Gatza, and Ronald E. Chasteen, both of Colorado Springs, Colo., assignors to Pacer Industries Inc., Branford, Conn.

Original No. 5,024,205, dated Jun. 18, 1991, Ser. No. 502,410, Mar. 30, 1990. Application for reissue Jul. 24, 1991, Ser. No. 735,396

Int. Cl.[5] F02P *11/00*

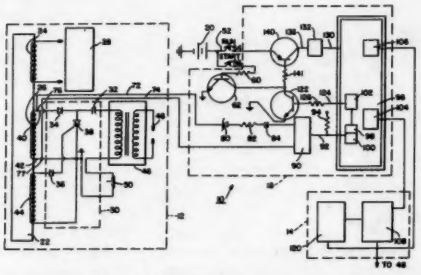
U.S. Cl. 123—632 **23 Claims**

1. In a snowmobile engine having a battery and at least one spark plug, an electronically controlled fuel system comprising:

fuel injection means for the delivery of fuel to said engine during the operation thereof;

ignition means for providing an electrical output to said spark plug sufficient to enable said plug to ignite s id fuel delivered by said fuel injection means;

electronic control means electrically connected to said battery for controlling the operation of said fuel injection means, said electronic control means comprising a microprocessor having detector means therein electrically coupled to said ignition means for determining when said electrical output of said ignition means drops below a minimum threshold level, said microprocessor further comprising signal generator means for generating a battery disconnection signal when said detector means determines that said electrical output of said ignition means is below said threshold level; and



switch means electrically coupled between said battery and said microprocessor for receiving said battery disconnection signal from said signal generator means and disconnecting said electronic control means from said battery when said battery disconnection signal is received.

Re. 34,080

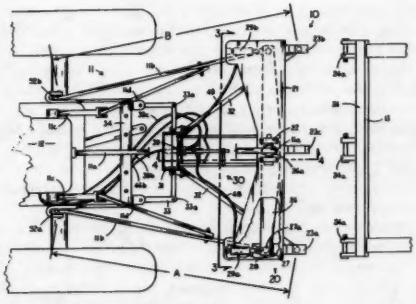
ROW FOLLOWING GUIDANCE DEVICE FOR A TRACTOR-DRAWN ROW CROP IMPLEMENT

Eugene H. Schmidt, Madrid, Nebr., assignor to New Tek Manufacturing, Inc., North Platt, Nebr.

Original No. 4,640,365, dated Feb. 3, 1987, Ser. No. 726,802, Apr. 24, 1985. Application for reissue Dec. 14, 1987, Ser. No. 132,321

Int. Cl.[5] A01B *69/00*

U.S. Cl. 172—5 **22 Claims**



20. A row following guidance device for a tractor-drawn implement, comprising:

a first horizontal elongated member having means for attachment to the forward end of a farm implement, which attachment means is adapted to be arranged transversely of crop rows;

a second horizontal elongated member having means for attachment to a tractor, said second member being pivotally attached about a vertical axis at a point thereon intermediate its

ends to said first member at a point thereon intermediate its ends, wherein one of said first and second members is characterized as having a portion thereof located between said intermediate point and an end thereof;

a hydraulic cylinder pivotally connected at one end to a point within said portion of said one of said first and second members and pivotally connected at its other end to said other member at a point away from said intermediate point thereon; and

means pulled by said tractor and adapted to be responsive to lateral movements of the implement in relation to the crop rows for transmitting signals proportionate to said lateral movement to a hydraulic pressure means for actuating said hydraulic cylinder to cause pivotal movement between said first and second members.

RE34,081

Patent Not Issued For This Number

Re. 34,082

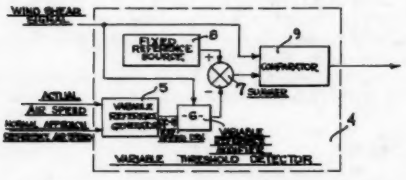
VARIABLE THRESHOLD WIND SHEAR WARNING SYSTEM

Leonard M. Greene, White Plains, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

Original No. 4,855,738, dated Aug. 8, 1989, Ser. No. 79,905, Jul. 31, 1987. Application for reissue Jan. 25, 1991, Ser. No. 646,850

Int. Cl.[5] G08B *23/00*

U.S. Cl. 340—968 **6 Claims**



1. An improved aircraft wind shear warning system for warning of hazardous wind shear conditions during an aircraft landing approach of the type having means for generating a signal [representing] *which is a function of* the rate of change of the instantaneous airspeed of aircraft, means for generating a signal [representing] *which is a function of* the horizontal inertial acceleration of the aircraft, means for subtracting the horizontal inertial acceleration signal from the rate of change of the instantaneous airspeed signal to provide a wind shear signal [representing] *which is a function of* wind shear and warning device means for generating a warning signal wherein the improvement comprises:

means for generating a warning threshold the value of which warning threshold is negative and the magnitude of which warning threshold is the arithmetic combination of a pre-selected negative constant and a variable number which variable number is a function of the excess, if any, of the airspeed of the aircraft over a normal approach reference airspeed and which variable number is adjusted in response to the wind shear signal, when the wind shear signal has exceeded a pre-selected value during the landing approach; and

detector means responsive to the wind shear signal for actuating said warning device means when the wind shear signal is more negative than said warning threshold.

Re. 34,083

CAMERA WITH MOTORIZED FILM REWINDING DEVICE

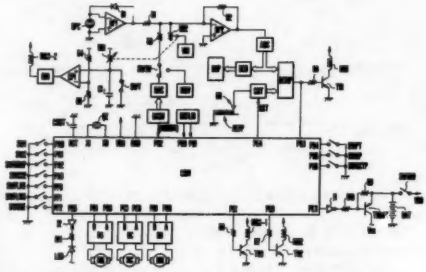
Masaharu Kawamura; Yoshihito Harada; Ryuichi Kobayashi; Masayuki Suzuki, all of Kanagawa; Tsunemasa Ohara, and Yoichi Tosaka, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Original No. 4,752,793, dated Jun. 21, 1988, Ser. No. 945,359, Dec. 22, 1986. Application for reissue Jun. 19, 1990, Ser. No. 540,192

Claims priority, application Japan, Dec. 26, 1985, 60-29668; Jan. 30, 1986, 61-016756

Int. Cl.[5] G03B *1/18*

U.S. Cl. 354—173.11 **22 Claims**



12. A camera with a motorized film rewinding device, comprising:

(a) a motor;

(b) film rewinding means for rewinding a film and having said motor as a drive source,

(c) detecting means operative for detecting the rewinding movement of said film and producing a signal upon detection of such rewinding movement; and

(d) control means for automatically stopping said motor responsively to operation of said detecting means, said control means stopping said motor when said signal is not detected within a first time under an initial condition of said film rewinding and stopping said motor when the signal is not detected within a second time different from said first time so as to prevent a leader part of said film from being entangled in a film cartridge.

Re. 34,084

VERTICAL ACTION CONTACT SPRING

Rocco J. Noschese, Wilton, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Original No. 4,961,709, dated Oct. 9, 1990, Ser. No. 310,325, Feb. 13, 1989. Application for reissue May 24, 1991, Ser. No. 705,488

Int. Cl.[5] H01R *9/09*

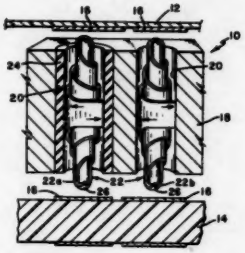
U.S. Cl. 439—66 **15 Claims**

10. An electrical connector comprising:

a matrix block having holes therein; and

spring contacts connected to the matrix block and at least partially located in the holes, the contacts having ends extending out of the holes from opposite sides of the matrix block, each contact being comprised of a one-piece member rolled into a column shape and adapted to radially frictionally hold

the contact in a hole of the matrix block and adapted to be longitudinally deflectable between two members such that the



contacts can contact the two members at various different distances therebetween.

Re. 34,085

THERMOPLASTIC AROMATIC POLYETHERKETONES

John B. Rose, Letchworth, and Philip A. Staniland, Tewin Wood, both of England, assignors to Imperial Chemical Industries, London, England

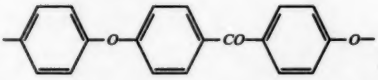
Original No. 4,320,224, dated Mar. 16, 1982, Ser. No. 956,045, Oct. 31, 1978. Continuation-in-part of Ser. No. 873,477, Jan. 30, 1978, abandoned. Application for reissue May 25, 1983, Ser. No. 498,116

Claims priority, application United Kingdom, Sep. 7, 1977, 37345; Jan. 13, 1978, 1412

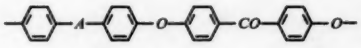
Int. Cl.[5] C08G 65/40

U.S. Cl. 528—125 **14 Claims**

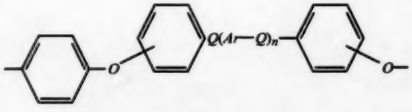
14. A tough crystalline thermoplastic aromatic polyetherketone consisting essentially of the repeat unit I



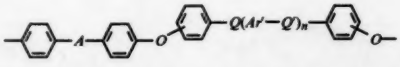
alone or in conjunction with at most 50 mole %, based on the total repeating units, of other repeating units selected from the group consisting of the repeating units IV



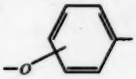
the repeat units V



and the repeat units VI

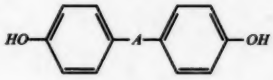


divalent hydrocarbon radical, the oxygen atoms in the subunits

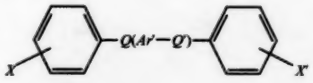


are ortho or para to the groups Q and Q', Q and Q' which may be the same or different are —CO— or —SO_2—, Ar' is a divalent aromatic radical, and n is 0, 1, 2 or 3, said polymer having an inherent viscosity IV, as measured at 25° C. on a solution of the polymer in concentrated sulphuric acid of density 1.84 g.cm^3 said solution containing 0.1 g of polymer in 100 cm^3 of solution, of at least 0.7 (which corresponds to a reduced viscosity RV, as measured at 25° C. on a solution of the polymer in concentrated sulphuric acid of density 1.84 g.cm^3 of solution, of at least 0.8) said solution containing 1 g of polymer in 100 cm^3.

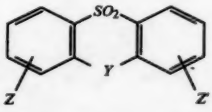
15. A process for the production of a tough crystalline thermoplastic polyetherketone which process comprises polycondensing, under substantially anhydrous conditions, at least one bisphenol which is hydroquinone or hydroquinone and at least one other co-condensate bisphenol of the formula



where A is a direct link, oxygen, sulphur, —SO_2—, —CO—, or a divalent hydrocarbon radical, and at least one aromatic dihalide which is 4,4'-difluorobenzophenone or 4,4'-difluorobenzophenone and at least one co-condensate aromatic dihalide of formula



where X and X' which may be the same or different are halogen atoms and are ortho or para to the groups Q and Q', Q and Q, which may be the same or different are —CO— or —SO_2—, Ar' is a divalent aromatic radical at most 50 mole % of the total amount of bisphenol and/or aromatic dihalide being said co-condensates, there being substantially equimolar amounts of bisphenol and aromatic dihalide, in the presence of at least one alkali metal carbonate or bicarbonate used in an amount providing at least 2 gram atoms of alkali metal per mole of bisphenol, the alkali metal or metals being selected from sodium, potassium, rubidium, and caesium provided that the sole use of sodium carbonate and/or bicarbonate is excluded, and in the presence of a solvent having the formula



where Y is a direct link, an oxygen atom or two hydrogen atoms (one attached to each benzene ring) and Z and Z' are hydrogen or a phenyl group, within the temperature range 150° C. to 400° C., the final temperature level during the polycondensation being sufficiently high to maintain the final polymer in solution, such that a polymer having an IV of at least 0.7 (which corresponds to an RV of at least 0.8) is obtained.

PLANT PATENTS

GRANTED SEPTEMBER 29, 1992

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,986
HYBRID MINIATURE ROSE PLANT NAMED WEKHELEN

Thomas F. Carruth, Altadena, Calif., assignor to Weeks Wholesale Rose Grower, Inc., Upland, Calif.

Filed Feb. 7, 1991, Ser. No. 651,752
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—7.1 **1 Claim**

1. A new and distinct variety of hybrid miniature rose plant substantially as shown and described.

7,987
MINIATURE ROSE PLANT NAMED SAVAFACE

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Jan. 8, 1991, Ser. No. 639,251
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described.

7,988
FLORIBUNDA ROSE PLANT CARALE

Robert Strahle, Carlton, Oreg., assignor to Carlton Rose Nurseries, Inc., Carlton, Oreg.

Filed Nov. 29, 1990, Ser. No. 619,562
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—15 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class obtained as a seedling from a seed parent entitled "Escort" and a pollen parent entitled "Golden Nugget," characterized by its solid yellow color which is maintained from flower opening through petal drop, and its ability to yield flowers on a continuous basis when grown in a greenhouse, substantially as shown and described.

7,989
HYBRID TEA ROSE PLANT NAMED LIVERPOOL REMEMBERS

Gareth Fryer, Knutsford, England, assignor to Roses by Fred Edmunds, Inc., Wilsonville, Oreg.

Filed Jan. 18, 1991, Ser. No. 643,717
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—16 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described.

7,990
"AUTUMN ROSE" PEACH TREE

Roy D. Richardson, Rte. 2, Box 520, Bakersfield, Calif. 93307

Filed Apr. 1, 1991, Ser. No. 680,245
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—43.2 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described and which is closely similar to the "Autumn Gem" peach tree (U.S. Plant Pat. No. 3,582), producing large freestone fruit of a yellow ground color and a streaked and mottled red blush coloration, but from which it is distinguished and characterized principally as to novelty by producing such fruit which are mature for commercial harvesting and shipment approximately November 1st to November 20th in the Southern San Joaquin Valley of central California.

7,991
GERBERA PLANT NAMED TERTALA

Lambertus J. M. Stravers, Kudelstaart, Netherlands, assignor to Terra Nigra BV, De Kwakel, Netherlands

Filed Jan. 25, 1991, Ser. No. 645,603
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68.1 **1 Claim**

1. A new and distinct cultivar of Gerbera plant named Tertala, as illustrated and described.

7,992
CHRYSANTHEMUM PLANT NAMED HOLLY

Peter S. Hesse, Nipoma, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 8, 1991, Ser. No. 659,556
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct Chrysanthemum plant named Holly, as described and illustrated.

7,993
CHRYSANTHEMUM PLANT NAMED SHELLEY

Peter S. Hesse, Nipoma, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 6, 1991, Ser. No. 652,418
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct Chrysanthemum plant named Shelley, as described and illustrated.

PATENTS

GRANTED September 29, 1992

ERRATA

29-033	5,150,496
33-203	5,150,515
29-623	5,150,602
76-108	5,150,636
81-057	5,150,642
114-230	5,150,744
433-229	5,151,044
55-387	5,151,116
430-548	5,151,356
430-610	5,151,357
548-530	5,151,536
335-172	5,151,671
357-017	5,151,724
351-156	5,151,778
395-750	5,151,855
378-065	5,151,931
379-058	5,151,946
379-093	5,151,972

PATENTS

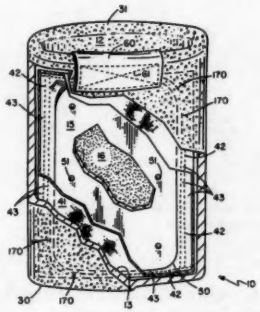
GRANTED SEPTEMBER 29, 1992

GENERAL AND MECHANICAL

5,150,475
PROTECTIVE WRISTBAND

Brian J. Hansen, 5717 21st Ave. S., Minneapolis, Minn. 55417, and Stewart L. Hansen, 8305 West Bend Rd., Golden Valley, Minn. 55427

Filed Dec. 10, 1990, Ser. No. 625,074
Int. Cl.[5] A41D *13/08*
U.S. Cl. 2—16 **19 Claims**



17. A protective wristband for protecting a wrist, comprising:

a) a band to encircle the wrist and comprising inner and outer layers of absorbent, stretchable material, the inner layer confronting the wrist, the inner and outer layers being integral along a pair of integral ledges to form an endless hollow interior, the band being applied by being stretched over the hand of the wrist,

b) a shield with inner and outer faces, the shield being at least semirigid, the shield including a curvature such that the shield fits comfortably over the wrist, the shield including at least one hole for ventilation,

c) a cushion secured to the inner face of the shield to be disposed between the shield and the wrist, the cushion having approximately the same width and height of the shield, the cushion also having approximately the same curvature as the shield, the cushion having an aperture aligned with the hole of the shield for ventilation, and

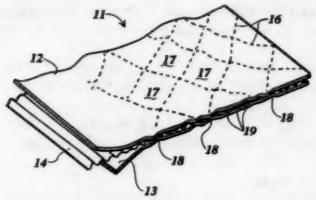
d) the shield including a periphery and being retained in generally one place between the inner and outer layers by stitching disposed at least partially about the periphery, the stitching connecting the inner and outer layers.

5,150,476
INSULATING FABRIC AND METHOD OF PRODUCING SAME

Denise N. Statham, Powder Springs; Michael T. Stanhope, Atlanta, and Thomas J. Hejhal, Dunwoody, all of Ga., assignors to Southern Mills, Inc., Union City, Ga.

Filed Mar. 22, 1991, Ser. No. 673,950
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—93 **21 Claims**

1. An insulating textile fabric for use in protective garments of the type commonly worn by fire fighters, said insulating fabric comprising an outer layer of material, an inner layer of material, and an intermediate layer of material sandwiched between said outer and inner layers of material, said intermediate layer of material extending substantially continuously throughout the length and breadth between said inner and outer layers of material and including an array of pleats having a series of alternately oppositely extending peaks extending alternately into engagement with said outer and inner layers of material and maintaining said outer and inner layers of material in mutually spaced relationship, with said pleats of said intermediate layer of materil defining a plurality of air channels between said outer and inner layers of material, spaced lines of stitching extending across said pleats and securing together said outer, intermediate, and inner layers of material along a

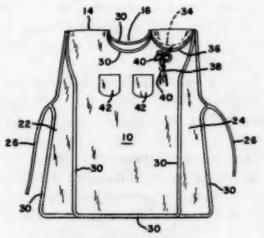


plurality of spaced paths extending across said air channels and maintaining said intermediate layer of material in position between said outer and inner layers of material and in its pleated configuration between said lines of stitching, and said spaced lines of stitching collapsing together the outer, inner and intermediate layers of material along the lines of stitching.

5,150,477
HOSPITAL GOWN

Joyce E. Elberson, c/o Jacob and Betty Walters, Box 307, Saxton, Pa. 16678, and Mary F. Ritchey, 435 Lincolnway Dr., York, Pa. 17404

Filed Mar. 6, 1992, Ser. No. 846,888
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—114 **2 Claims**



1. A one-piece hospital gown formed from a unitary area of woven sheet-like material and comprising a relatively narrow front panel having parallel opposite side edges and being of predetermined length and said front panel being integral at shoulder regions with a corresponding end of a wider rear panel of which opposite side edge portions comprise integral elongated flaps having smoothly tapering and diverging outer edges respectively adapted to overlap appreciable opposite side edge portions of said front panel in a manner to effectively cover especially a person's torso when wearing the gown, said gown also having an opening in said shoulder region where said panels are integrally connected and through which a person's head is adapted to extend when mounting the gown for wearing, and said flaps respectively intermediately of said opposite elongated edges thereof having elongated tie members connected to and formed by extensions of channel-type textile binding extending around and secured to substantially all edges of said integral front and rear panels and said tie members being adapted to extend across the exterior of said front panel when the gown is worn and are releasably con-

nected to each other, said arrangement of the panels being such as to provide substantially complete encirclement and coverage of the torso of a person when wearing said gown and said panels being adapted to permit ready movement thereof to expose said torso of the person for medical, as well as toilet operations.

5,150,478

METHOD FOR THE PRODUCTION OF MODULABLE GARMENTS

Mauricette Niedajkasza, 58, Avenue du Rouquet, 33700 Merignac; Bruno Niedajkasza, and Catherine Niedajkasza, both of Merignac, all of France, assignors to Mauricette Niedajkasza, Merignac, France

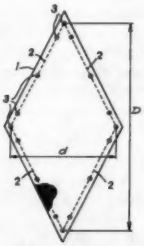
PCT No. PCT/FR89/00216, § 371 Date Oct. 31, 1990, § 102(e) Date Oct. 31, 1990, PCT Pub. No. WO89/10706, PCT Pub. Date Nov. 16, 1989

PCT Filed May 3, 1989, Ser. No. 601,806

Claims priority, application France, May 3, 1988, 88 05932

Int. Cl.[5] A41D *27/00*

U.S. Cl. 2—243 R **8 Claims**



1. A method for producing a modulable garment comprising the steps of:

providing a plurality of elementary pieces of a material containing a diamond shaped contour with corners at each end of a small diagonal of said diamond shaped contour and corners at each end of a large diagonal of said diamond shaped contour,

arranging four of said elementary pieces in side by side relation, with the large diagonals of the contours of said elementary pieces substantially parallel to one another; and

joining said four elementary pieces together using fastening means at said corners at each end of said small diagonals of said diamond shaped contour to provide a garment to fit around a hip or chest portion of an intended wearer.

5,150,479

PROTECTIVE HELMET

Richard A. Oleson, Lexington, Ky., assignor to E. D. Bullard Company, Sausalito, Calif.

Filed Sep. 23, 1991, Ser. No. 763,619

Int. Cl.[5] A42B *3/00*

U.S. Cl. 2—414 **14 Claims**

14. A protective helmet comprising:

an outer shell,

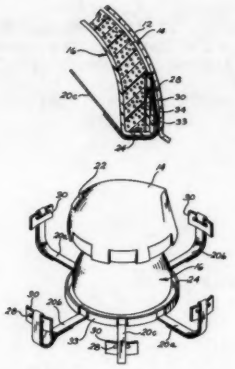
a compressible foam liner disposed in said outer shell,

a rigid inner shell disposed at least partially within said foam liner,

an annularly extending channel attached to an outer edge portion of said inner shell, an edge portion of said liner being disposed within said channel,

a suspension system including a series of flexible, stretchable, resilient straps, and

incompressible, non-resilient means disposed in said channel between a surface of said foam liner and said outer shell for securing distal end portions of said straps thereto such that an apex impact loading force applied to said shell within design limits of said helmet is absorbed without



producing deformation of said liner at the location of said strap securing means.

5,150,480

SUPPORT FOOTING FOR TOILET

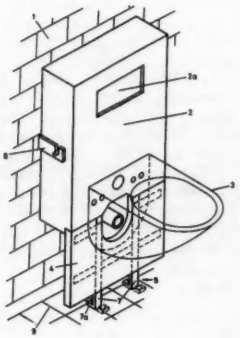
Peter Schmucki, Eschenbach, Switzerland, assignor to Geberit AG, Switzerland

Filed Oct. 31, 1990, Ser. No. 606,883

Claims priority, application Switzerland, Nov. 10, 1989, 4057/89

Int. Cl.[5] E03D *11/14*

U.S. Cl. 4—252.3 **7 Claims**



1. A foot support for mounting an installation block of a toilet arrangement in front of or in a building wall, comprising:

an H-shaped beam including two vertically extending side supports, said side supports being formed of metal pipe elements which are rectangular in cross section having two broad sides and two narrow sides, said metal pipe elements being formed open at the bottom and having bent top portions, said top portions being fastened to the installation block, said vertically extending side supports being exposed substantially in parallel to and at a spaced location from the building wall; foot elements including vertically extending generally rectangular members having two broad sides and two narrow sides and having bent foot members, said foot elements being inserted into corresponding ones of said open bottoms of adjusting the height of said H-shaped beam; and, fixing means for fixing said

foot elements relative to said H-shaped beam, said side supports include a broad side with a depression substantially in the middle of said broad side, said depression extending in a longitudinal direction of said side support, thereby reducing the clearance between said side supports and said vertically extending members of said foot elements when said members are inserted in said side supports, wherein said fixing means are threaded into one of the narrow sides of said vertically extending side supports so as to engage a narrow side of said foot elements and clamp said foot elements between said fixing means, said depression, one broad side and one narrow side of said vertically extending side supports.

5,150,481

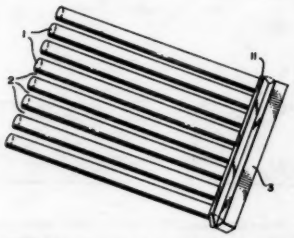
ANTI-LIQUID SPLASH DEVICE

Hian S. Pang, 7 Watten Drive, Singapore, Singapore 1128

Filed Mar. 26, 1991, Ser. No. 675,178

Int. Cl.[5] E03D *9/00*

U.S. Cl. 4—300.3 **10 Claims**



1. An anti-liquid splash device for a receptacle having an upright wall, a top and containing a body of liquid therein, said device comprising a plurality of distinct elongate floats (1) secured to and extending substantially parallel to one another from a support (3), the support including attachment means for attachment to the wall (5) of the receptacle or flow passage, wherein the elongate floats can be arranged to extend across substantially the entire surface (10) of the liquid in the receptacle or flow passage in a direction generally transverse to the wall of the receptacle, and wherein the elongate floats (1) can then be arranged to be impacted by any solid or fluid matter entering the top of the receptacle to deflect such solid or fluid matter from immediate impact with a major part of the liquid surface thereby inhibiting the splashing effect of that impact.

5,150,482

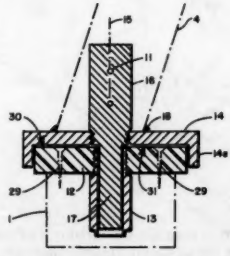
BATH CHAIR SWIVEL FOOT

Leo Shapiro, 5287 Ascott Bend, Boca Raton, Fla. 33496

Filed Jul. 25, 1991, Ser. No. 735,856

Int. Cl.[5] A47K *3/12*

U.S. Cl. 4—562.1 **9 Claims**



1. In a bath chair having a base with suction cups for rigidly attaching to the floor of a bath tub or shower stall and a stem with a chair body attached thereto, the improvement comprising a swivel connector for pivotally connecting the base to the chair stem, said swivel connector including a rotator disk rigidly attached to said base, said rotator disk having an upper supporting rotator surface, a surface opposite said supporting rotator surface, and a central opening formed therethrough, a hollow swivel cylinder rigidly attached to said rotator disk in said central opening, said swivel cylinder extending perpendicularly to said supporting rotator surface and extending from said surface of said rotator disk opposite said supporting rotator surface, a lid-shaped rotator shell rigidly attached to said stem, said rotator shell having a lower rotator surface engaging on said supporting rotator surface and having an encompassing lateral extension snugly surrounding said rotator disk when said rotator shell is placed on said rotator disk, and a cylindrical rotator pin depending perpendicularly from said lower swivel surface and received in said hollow swivel cylinder for frictionally rotating in said swivel cylinder when said rotator shell is placed on said rotator disk.

5,150,483

AUTOMATICALLY LOWERING TOILET SEAT

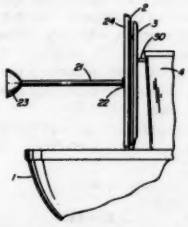
Harold J. M. Lochrie, R.R. #5, Brockville, Ontario, Canada K6V 5T5

Filed Apr. 10, 1991, Ser. No. 682,949

Claims priority, application Canada, Apr. 11, 1990, 2,014,345

Int. Cl.[5] A47K *13/10*

U.S. Cl. 4—246.1 **18 Claims**



1. An automatic seat lowering mechanism for a toilet seat pivotally mounted on a toilet bowl comprising:

arm means having a first end adapted to be attached to an outer edge portion of a toilet seat, the arm means projecting downwardly away from the plane of the toilet seat so as to be disposed clear of the toilet bowl when the toilet seat is in a horizontal position, and having a second end adapted to be supported by the front of a leg of a user when the toilet seat is in a generally upright position, the arm means being of sufficient length to extend between the toilet seat and the front of the user's leg to permit the toilet seat to be maintained in the generally upright position to allow use of the toilet from a standing position,

whereby in use, when the toilet seat has been raised by the user from the horizontal position, the toilet seat will fall under the force of gravity acting on the arm means or on the toilet seat and the arm means in combination when the second end of the arm means is not supported by the front of the leg of the user.

5,150,484

SUPPORT STRUCTURE FOR BEDS AND THE LIKE

Gordon Whitten, Jr., 1120 Saunders St., Hastings, Nebr. 68901

Filed Aug. 13, 1990, Ser. No. 566,132

Int. Cl.[5] A47C *19/00*

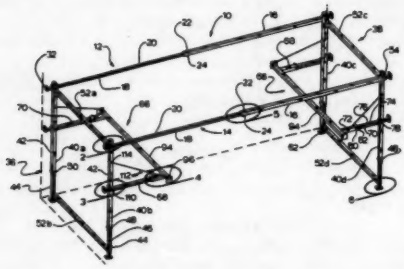
U.S. Cl. 5—9.1 **10 Claims**

1. A load bearing scaffold adapted to be supported on the floor of a room and to extend between opposite walls thereof for supporting articles, comprising:

a pair of vertical support beams adapted to be supported on a floor adjacent one wall;

a horizontal beam connected adjacent one end to and extending generally horizontally outwardly from at least one of said vertical support beams to resist movement of the vertical support beam toward an opposite wall;

means for adjusting the length of said horizontal beam wherein said means comprises a combination of a horizontal gross adjustment means whereby said horizontal beam may be adjusted to fit approximately between said opposite walls of a room, and a horizontal fine adjustment means, whereby said horizontal beam may be further



adjusted to substantially engage said opposite walls of a room;

means for adjusting the length of said vertical beams wherein said means comprises a combination of a vertical gross adjustment means, whereby said vertical beams may be adjusted to change the height of the articles, and a vertical fine adjustment means, whereby said vertical beams may be adjusted to make fine changes in the height of the articles; and

a platform means supported on said vertical support beams and extending outwardly therefrom toward said opposite wall.

5,150,485

BEACH BLANKET ANCHOR APPARATUS

Sean P. Maguire, 26 Barbie Dr., Rochester, N.Y. 14626

Filed Oct. 31, 1991, Ser. No. 785,686

Int. Cl.[5] A47G *9/06*

U.S. Cl. 5—417 **6 Claims**

1. A beach blanket anchor apparatus in combination with a flexible blanket web, including at least a plurality of anchor members securable to the anchor web, each of the anchor members are arranged in spaced adjacency relative to one another, and wherein each anchor member includes a planar base floor, and

a clamp plate, the clamp plate including a spring hinge, the spring hinge mounted to the planar base floor to bias the clamp plate in contiguous communication with the planar base floor to receive the blanket web between the clamp plate and the planar base floor, and

the anchor member includes a base member, and the base member is defined by the planar base floor at a lower terminal end of the base member, and the base member includes an externally threaded cylindrical upper end, the cylindrical upper end includes an upper end axis, and the upper end axis defines an acute included angle between the planar base floor and the externally threaded cylindrical upper end, and the base member further including a base member hollow cap, the hollow cap including an internally threaded lower end securable to the externally threaded cylindrical upper end, and the hollow cap further including a plurality of hollow leverage body legs projecting laterally of the hollow cap and oriented orthogonally relative to the spring hinge, wherein the hollow leverage body legs are in communication with the hollow cap to receive ballast material within the hollow leverage body legs and the hollow cap.

5,150,486

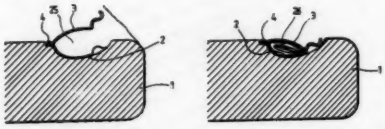
MATTRESS WITH SHEET RETAINING MEANS

Chang-Fu Wu, No. 69, Alley 69, Lane 285, Sec. 1, Nei Hu Rd., Taipei, Taiwan

Filed Apr. 17, 1992, Ser. No. 869,965

Int. Cl.[5] A47C *27/00*

U.S. Cl. 5—460 **1 Claim**



1. A mattress comprised of a rectangular mattress body, and a plurality of channel plates and clamps and characterized in that said mattress body has channels on a bottom edge along the four sides thereof with said channel plates respectively secured therein, said clamps being respectively secured to said channel plates said channel plates each having an elongated projection along a longitudinal peripheral edge thereof, said elongated projection having raised portions over a top edge thereof for clamping down said clamps in securing a sheet over said mattress body.

5,150,487

EVACUATION RESTRAINT

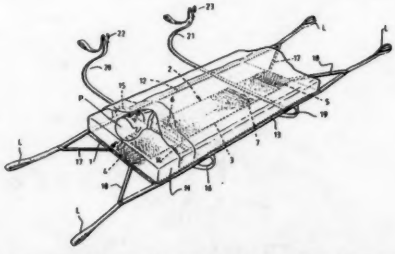
Desmond J. Hemphill, Ballarat1, Australia, assignor to Hemco Industries Pty. Ltd., Australia

Continuation of Ser. No. 603,778, filed as PCT/AU 89/00142, Mar. 31, 1989, abandoned. This application Feb. 11, 1992, Ser. No. 835,001

Claims priority, application Australia, Mar. 31, 1988, P17672

Int. Cl.[5] A61C *1/00*

U.S. Cl. 5—625 **9 Claims**



1. An evacuation restraint comprising a substantially rectangular base sheet (1) of strong flexible material, a substantially rectangular support member (2) located centrally of said base sheet (1) and joined thereto on top of said base sheet, said

support member being formed of a continous sheet of lightweight non-bulky material having greater rigidity than said base sheet and being capable of deformation transversely of the support member and being substantially equally rigid across its full width, said base sheet (1) extending substantially from either side of said support member (2) to enable the base sheet and support member in use to be flexed together and to uniformly envelop a patient to be evacuated, strap members (12,13,14,17,18,20,21) secured at least to said base sheet (1) and extending from the sides of the base sheet (1), said strap members including means (16,19,22,23) for connecting opposite strap members (12,13) together at at least two longitudinally spaced positions, and further strap members (12,13) extending from at least one end of said base sheet (1) by means of which the restraint can be manipulated during evacuation procedures, said support member (2) having substantially greater rigidity in the longitudinal direction than the transverse direction and providing with said base sheet a smooth relatively rigid base on which the restraint can slide during evacuation procedures.

5,150,488

MULTIFUNCTIONAL TOOL

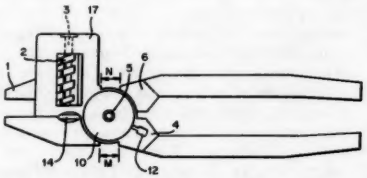
Gu F. Yuan; Kou M. Yuen; Zhao Q. Wei, and Gu Z. Ying, all of Kowloon, Hong Kong, assignors to Neng-Shi (Hong Kong) Industrial Co., Tokwawan, Hong Kong

Filed May 31, 1991, Ser. No. 708,678

Claims priority, application China, Jun. 9, 1990, 90207321

Int. Cl.[5] B25B *7/22*

U.S. Cl. 7—137 **3 Claims**



1. A multifunctional hand tool comprising:

a first handle with a front end and a back end including a hollow frame and a sliding jaw both mounted on the front end thereof;

a core pin and a regulating screw rotatably mounted on said core pin both located within said hollow frame;

a second handle with a front end and an back end, having a fixed jaw located at the front end thereof;

a pivotal joint pin for pivotally connecting said first and second handles together, with said jaws generally facing each other so that said handles are movable between an open and closed position and the hand tool is usable as pliers; and

locking means for locking said handles in the closed position so that said hollow frame is usable as a hammer head, and wherein said sliding jaw is operatively connected to said regulating screw so that rotation of said regulating screw moves said sliding jaw with respect to said fixed jaw whereby the hand tool is useable as a monkey wrench in the closed position.

5,150,489

APPARATUS AND METHOD FOR CONTROLLING A WASHING MACHINE

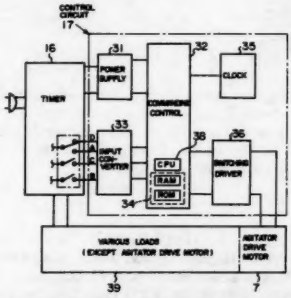
Shinichi Kaji, Katsuta; Kazuyuki Yano, Hitachi; Yoshitaka Shibata, Hitachi; Toshihiro Takahashi, Hitachi; Kiyomi Takamaru, Hitachi; Hideyuki Tobita, Hitachi, and Isao Hiyama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1991, Ser. No. 660,885

Claims priority, application Japan, Mar. 9, 1990, 2-056375

Int. Cl.[5] D06F *33/02*

U.S. Cl. 8—159 **11 Claims**



1. An apparatus for controlling a washing machine comprising a mechanical timer including a plurality of cam switches for controlling individual steps of washing, rinsing and dehydrating of the washing machine, a drive motor to drive the washing machine, electrical components and a control circuit including a controller, said cam switches for controlling an operation sequence and an operation timing of he individual steps of washing, rinsing and dehydrating of the washing machine and also controlling said electrical components, except said drive motor, to be controlled in each of the individual steps, and wherein said controller receives input signals from said cam switches of said mechanical timer to control the on and off timing of the drive motor.

11. A method for controlling a washing machine comprising the steps of:

selectively actuating cam switches of a mechanical timer for opening and closing a feed water valve for feeding water into a washing tub, and opening and closing a drain valve to drain the water from the washing tub;

controlling a control circuit to drive a drive motor according to a selected operation pattern; and

controlling said drive motor, the washing tub and an agitating member by said control circuit according to an operation pattern stored in memory means of said control circuit being controlled by said cam switches.

5,150,490

PROCESS FOR PRODUCING A RESILIENT OR PADDED INSERT FOR FOOTWEAR

Waldemar Busch, Heilbronn-Böckingen, and Norbert Lutz, Postbauer-Heng, both of Fed. Rep. of Germany, assignors to Storopack Hans Reichenecker GmbH & Co., Weinstadt, Fed. Rep. of Germany

PCT No. PCT/EP89/00008, § 371 Date Jun. 19, 1990, § 102(e) Date Jun. 19, 1990, PCT Pub. No. WO89/06501, PCT Pub. Date Jul. 27, 1989

PCT Filed Jan. 7, 1989, Ser. No. 499,411

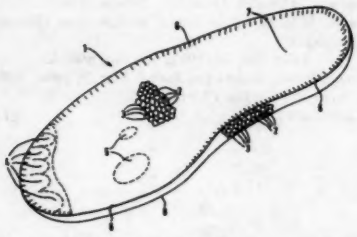
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 3802035

Int. Cl.[5] A43D *9/00*; A43B *13/38*

U.S. Cl. 12—146 M **21 Claims**

1. A cushioning or padding body for insertion into footwear, consisting of a thermoplastically deformable, resiliently cush-

ioning foam material comprising a plurality of individual foam material beads each provided with a closed surface and each being generally impermeable to air, said cushioning or padding body being formed by the process of:



introducing a plurality of said beads into a mold having a desired body shape and filling the mold; and

applying heat to the mold to sinter the beads causing cross-linking of the beads, thereby fixing the beads in their position relative to each other.

5,150,491

HAIR BRUSH

Shigeki Ikemoto, Higashi-Osaka, Japan, assignor to Ikemoto Burashi Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP90/00620, § 371 Date Dec. 14, 1990, § 102(e) Date Dec. 14, 1990, PCT Pub. No. WO90/14030, PCT Pub. Date Nov. 29, 1990

PCT Filed May 17, 1990, Ser. No. 623,420

Claims priority, application Japan, May 25, 1989, 1-61154

Int. Cl.[5] A46B *9/08*

U.S. Cl. 15—1.52 **10 Claims**

1. A hair brush comprising an electrically conductive brush base, a handle, a multiplicity of electrically conductive bristles provided upright on the surface of the brush base, and an antistatic member made of electrically conductive fiber and provided at each of widthwise opposite end portions of the brush base surface running longitudinally of the brush base; wherein the handle has a mount toward one end in the longitudinal direction thereof, and the conductive brush base is fitted to the mount; a multiplicity of small holes are formed in the brush base at each widthwise end portion thereof and arranged at a spacing in a row longitudinally of the base, the antistatic member being so provided as to project from the multiplicity of small holes slightly beyond the surface; and wherein the small holes communicate at the rear side thereof with an elongated groove formed in the rear surface of the brush base, and the antistatic member is fitted at its base portion in the groove, a barlike fixing member being inserted between the inner wall defining the groove and the base portion of the antistatic member to fix the antistatic member.

5,150,492

ULTRASONIC TOOTHBRUSH

Leonard W. Suroff, 12 Tompkins Ave., Jericho, N.Y. 11753

Filed Feb. 8, 1991, Ser. No. 652,628

Int. Cl.[5] A61C *17/32*; A46B *13/02*

U.S. Cl. 15—22.1 **55 Claims**

1. An ultrasonic toothbrush apparatus comprising:

A. an exchangeable toothbrush implement including;

a. an elongated body portion of vibration transmitting material having an oral contact portion disposed on one distal end of said body portion,

b. the other end of said body portion being hollow and provided with a centrally disposed opening,

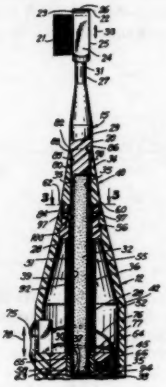
c. an elongated member of magnetostrictive material having one end thereof extending within said opening and coupled to said body portion in vibration transmitting relationship,

B. an ultrasonic power means for supplying vibratory energy in the ultrasonic range, said power means including;

i) an elongated hollow housing having an opening at one end for receiving said toothbrush implement, and

ii) mating locking means disposed proximate said one end of said elongated hollow housing;

C. means for rigidly and removably mounting said ex-



changeable toothbrush implement upon said ultrasonic power means for transmitting vibratory energy through said body portion to said oral contact portion substantially free from absorbing ultrasonic energy in said ultrasonic power means including;

i) locking means, said locking means cooperating with said mating locking means disposed upon said power means to retain said toothbrush implement in fixed relationship to said ultrasonic power means during use of said toothbrush, said exchangeable toothbrush implement being removed from said ultrasonic power means with a relatively small separating force therebetween; and

D. closure means encompassing said elongated magentrostrictive member of said body portion wherein said elongated magnetostrictive member is sealed for preventing moisture and liquid from entering said implement.

5,150,493

PIPELINE PIG

Orlande Sivacoe, 4700 - 55 Street, #601, Red Deer, Alberta, Canada T4N 2H8

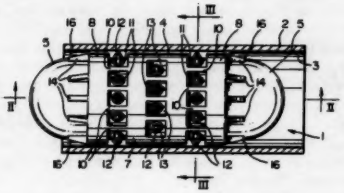
Filed Mar. 25, 1991, Ser. No. 674,386

Int. Cl.[5] B08B *9/04*

U.S. Cl. 15—104.061 **5 Claims**

1. A pig for use in a pipeline comprising onepiece, elongated, flexible, cylindrical body means; a plurality of annular rib means integral with said body means; longitudinal rib means integral with said body means extending between adjacent said annular rib means and defining recesses with said annular rib means; and tooth means extending out of said body means in

each said recess, said tooth means and said rib means simultaneously engaging the interior of a pipeline when the pig is



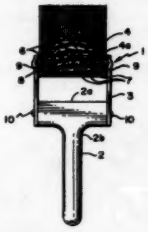
moved through the pipeline by a pressure differential in the pipeline.

5,150,494

PAINT BRUSH WITH DOME SHAPED MEMBER FOR PREVENTING PAINT FROM COLLECTING IN THE FERRULE

Kenneth C. Wenzer, 14011 Chestnut La., Laurel, Md. 20707

Filed Apr. 12, 1991, Ser. No. 684,265
Int. Cl.[5] A46B *3/02*
U.S. Cl. 15—159.1 **3 Claims**



1. A paint brush configured so as to facilitate cleaning the brush bristles comprising a handle having a flat rectangular end portion, an annular metal ferrule secured to said handle a binder evenly dispersed in said ferrule and secured by grooves formed in said ferrule, (and) said binder being spaced from said end portion of said handle, a dome-like shaped hard plastic member having a flat lower end adhesively bonded to said binder and having a plurality of perforations extending through said dome shaped member, a plurality of bristles extending through said perforations and having butt ends, said butt ends being immersed and fixed in the binder, said dome-like shaped member having a first portion which protrudes away from the handle and second portions on opposite sides of the first portion which taper to the ferrule to form a generally convex barrier between the exposed bristles and the binder, whereby paint collected during painting settles on the dome-like shaped member rather than in the binder to facilitate mechanical removal of the paint.

5,150,495

DISPOSABLE DENTAL BRUSH

John Discko, Jr., Hamden, and William B. Dragan, Easton, both of Conn., assignors to Centrix, Inc., Shelton, Conn.

Continuation-in-part of Ser. No. 325,888, Mar. 20, 1989, Pat. No. 5,001,803. This application Mar. 19, 1991, Ser. No. 671,523
Int. Cl.[5] A46B *9/04, 17/02*
U.S. Cl. 15—167.1 **4 Claims**

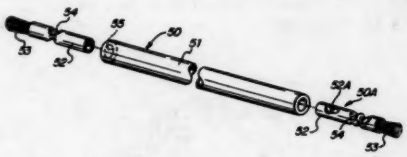
1. A readily disposable dental brush for applying various dental materials to a tooth in thin, even coatings comprising

an elongated tubular handle member having a bore extending co-extensively therethrough,

said handle member being open on at least one end,

a relatively short tubular brush holder having an external diameter sized to be frictionally received within the bore of said handle member at said one end thereof,

a tuft of bristles connected to one end of said brush holder,



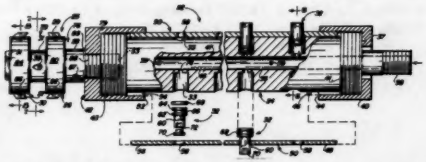
and means intermediate the ends of said brush holder defining a hinge section about which said bristles can be angularly disposed relative to the axis of said brush holder.

5,150,496

INTERNAL GRINDING AND CUTTING DEVICE FOR PIPE AND CASING

Scott Bromley, Lovington, N. Mex., assignor to Scott Tech International, Inc., Lovington, N. Mex.

Continuation-in-part of Ser. No. 575,263, Aug. 30, 1990, Pat. No. 5,062,187, which is a continuation-in-part of Ser. No. 413,540, Sep. 7, 1989, Pat. No. 4,954,023. This application Aug. 2, 1991, Ser. No. 739,377
Int. Cl.[5] B23B *47/00*
U.S. Cl. 29—33 T **19 Claims**



6. The method of removing a plastic coating from the inside surface of a pipe section, comprising the steps of:

arranging a grinderhead having a mandrel axially aligned respective to the pipe section;

mounting the mandrel to a rotatable shaft that can be moved axially along the interior of the pipe section by connecting one end of the mandrel to one end of the shaft;

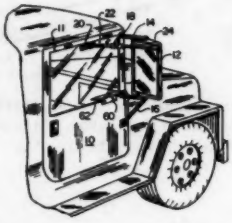
forming a plurality of piston receiving cylinders in said mandrel in spaced relationship respective to one another;

reciprocatingly receiving a radially active piston within each of the piston receiving cylinders to be moved radially respective to the mandrel;

reciprocating and rotating the grinderhead through the interior of the pipe section by reciprocating and rotating the shaft;

connecting the piston receiving cylinders to a common source of pressure and thereby effect a pressure drop across each of the radially active pistons of a magnitude to extend the outer face of the pistons into contact with the interior wall surface of the pipe section, thereby removing material from the interior wall surface of the pipe section during rotation of said grinderhead while permitting said grinderhead to be moved axially within the pipe section and thereby provide the pipe section with a minimum inside diameter.

5,150,497
TRUCK MIRROR WIPER
Marc R. Preik, 121 Boyette Dr., Lenoir, N.C. 28645
Filed Dec. 3, 1991, Ser. No. 802,050
Int. Cl.[5] B60S *1/06, 1/14, 1/44*
U.S. Cl. 15—250.003 **9 Claims**



1. A truck mirror wiper for a truck having a side mirror to be wiped and a side window glass which may be raised and lowered and through which a driver looks to view the mirror, comprising

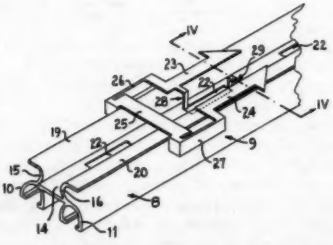
a mount to mount the truck mirror wiper to the window glass,

a bracket extending from said mount to the proximity of the mirror when said mount is mounted on the window glass, and

a wiper blade affixed to said bracket in contact with said mirror when said mount is mounted on the window glass,

whereby a driver may lower or raise the window glass, thereby causing said wiper blade to pass over the mirror to wipe it.

5,150,498
WIPER REFILL UNIT WITH IMPROVED CLIP
Cedric S. K. Charng, Taipei, Taiwan, assignor to China Wiper Special Rubber Co., Ltd., Taipei, Taiwan
Filed Dec. 17, 1990, Ser. No. 628,493
Int. Cl.[5] B60S *1/04, 1/38, 1/28*
U.S. Cl. 15—250.42 **12 Claims**



1. A wiper refill unit for removable attachment to a wiper blade superstructure having a set of claw members, the refill unit comprising:

an elongate flexible backing strip having

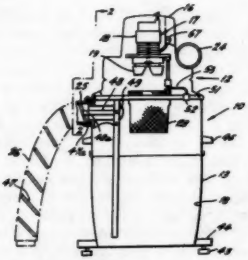
at least one slot means defining at least one elongate slot for receiving at least one elongate resilient wiping element;

an elongate side flange extending along each side of the backing strip, the two side flanges being intended in use to be slidably received and retained by the set of claw members of the wiper blade superstructure; and

an elongate central portion disposed between said side flanges and provided with a plurality of aperture means spaced apart in the elongate direction, said central portion including parts which surround each said aperture means; and

a clip having a body portion and a pair of spaced apart legs extending in opposed, spaced relationship to each other from said body portion, said legs being resiliently deflectable toward and away from each other and being positionable to overlie respective ones of said side flanges, each leg having latching means extending therefrom which project through a selected one of said aperture means, the latching means on each leg being positioned thereon in spaced relationship to the body portion whereby, when said legs are deflected toward each other, the latching means on each leg approaches the opposite leg, and said latching means having means respectively projecting outwardly beneath the central portion in opposite directions such that engagement of said outwardly projecting means with said central portion holds the clip in engagement with the backing strip unless the legs are squeezed toward each other to allow said outwardly projecting means to pass through said selected aperture means, whereby the clip can be detachably secured at a selected position on the backing strip, thereby enabling, when the set of claw members receive and retain the backing strip, releasable fastening of one of the claw members of the wiper superstructure to the clip to resist sliding of the backing strip relative to the set of claw members, and whereby the clip is prevented from accidental removal from the backing strip even when the backing strip is not secured to claw members of the wiper superstructure.

5,150,499
STATIC ELECTRIC DISCHARGE FOR DUST COLLECTOR
Robert C. Berfield, Jersey Shore, Pa., assignor to Shop Vac Corporation, Williamsport, Pa.
Filed Nov. 16, 1990, Ser. No. 614,711
Int. Cl.[5] H05F *3/02*
U.S. Cl. 15—327.1 **17 Claims**



1. A dust collector comprising:

a dust collecting tank having an internal chamber, an open top and an air inlet duct into the tank chamber;

a separable lid attached to the tank over the open top;

suction means, supported on the lid, responsive to electrical power for generating reduced air pressure within the chamber;

first electrical connecting means, including a grounding element, for connecting the suction means to a source of electric power including a source of ground potential;

an electrically non-conductive hose having an outlet end connecting to the air inlet duct and having an inlet end through which air may be drawn into the hose when reduced air pressure is generated within the chamber;

an electrically conductive element extending along and contacting the hose and providing a low resistance path to any electrostatic charge which may develop on the hose; and

second electrical connecting means for connecting the elec-

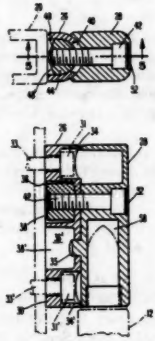
trically conductive element to the ground element of the first electrical connecting means, the second electrical connecting means comprising a tank contact on the tank electrically connectable with the electrically conductive element, the tank contact including a first metallic strap at the inlet duct to the tank and a lid contact on the lip connected with the grounding element, and arranged for engaging the first metallic strap regardless of the orientation of the lid when the lid is on the tank to thereby assure electrical contact between the tank contact and the ground element.

5,150,500

ADJUSTABLE LIFT-OFF HINGE

Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.

Filed Jul. 11, 1991, Ser. No. 728,346
Int. Cl.[5] E05D 7/04
U.S. Cl. 16—239 **30 Claims**



1. An adjustable lift-off hinge assembly comprising:
(a) a support member mounted onto a frame, said support member having a longitudinal axis, and further having at least one generally planar mounting surface;
(b) a knuckle assembly mounted onto a door comprising, in combination;
(i) a longitudinal adjustable knuckle member rotatably coupled to said support member along said longitudinal axis; and
(ii) a longitudinal fixed base member having at least one generally planar outer surface mounted onto said door, and further having a generally convex outer surface pivotally connected to a longitudinal side of said adjustable knuckle member;
(c) rotatable coupling means for rotatably coupling said support member to said knuckle assembly; and
(d) pivotal coupling means for pivotally coupling said convex outer surface of said fixed base member to said longitudinal side of said adjustable knuckle member.

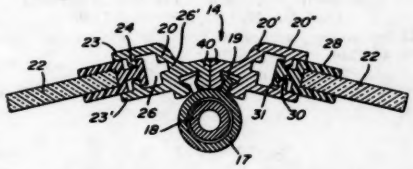
5,150,501

HINGE CONNECTING POST FOR FOLDING CLOSURES

Jeffrey Pasternak, Pierre Fonds, Canada, assignor to Dynaflair Corporation Canada Inc., Point Claire, Canada

Filed Dec. 12, 1989, Ser. No. 448,967
Int. Cl.[5] E05D 7/12, 15/26
U.S. Cl. 16—272 **9 Claims**

1. A folding closure displaceably supportable in an opening to secure said opening, said closure being comprised of a plurality of elongated vertical panels interconnected along their vertical edges by a hinge assembly to permit said panels to fold in an accordion fashion for storage and to extend in an undulating stretched manner to obstruct said opening, said hinge assembly having hinge attaching members to pivotally secure respective pairs of opposed panel connecting posts thereto, each said connecting post having detachable securement means for connection to said hinge attaching members, said connecting posts further having a connecting slot for securing panel elements thereto, the improvement comprising said connecting slot having an extension protective flange at least on an outer side portion of said connecting post to overlap and conceal an attachment member of a connector strip removably secured in said connecting slot, said connector strip being connected along a side edge of said vertical panels, said detachable securement means being a connection member formed integral with a bottom wall of said connecting slot and extending along the entire length of said connecting post, said connection member having a flat outer abutment face spaced from said bottom wall and a substantially transverse connecting face having an elongated slot therein.

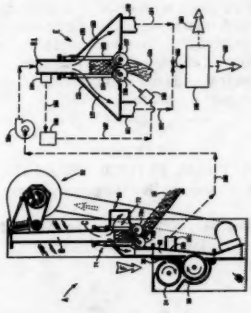


5,150,502

TEXTILE FIBER LENGTH SORTING APPARATUS AND METHOD

James H. Roberson, 10 Ashwood Ave., Greenville, S.C. 29607

Continuation-in-part of Ser. No. 339,058, Apr. 14, 1989, Pat. No. 4,970,759. This application Nov. 19, 1990, Ser. No. 615,258
Int. Cl.[5] D01G 9/08, 15/40
U.S. Cl. 19—105 **61 Claims**



1. Textile apparatus for forming a fibrous batt having a prescribed density profile and being comprised of sorted textile fibers, said apparatus comprising:
fiber supply means for supplying raw textile fibers;
a first air flow path;
fiber opening means receiving said raw textile fibers from said fiber supply means for loosening and separating said raw textile fibers to produce opened fibers and for introducing said opened fibers to said first air flow path;
air propelling means creating an air flow for transporting said opened fibers along said first air flow path;
first fiber extraction means associated with said first air flow path for extracting fibers having an average length greater than or equal to a preselected length from said air flow to produce useful long fibers and create a separated air flow containing useful short fibers having an average fiber

length less than said preselected length to continue along in said separated air flow;

fiber compacting means for compacting said useful long fibers into a compacted batt and discharging said compacted batt from said apparatus.

5,150,503

CONTINUOUS TENSIONING RING FOR MOUNTING CONVOLUTED BOOTS

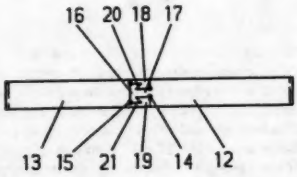
Karl-Heinz Müller, Wissen, Fed. Rep. of Germany, assignor to GKN Automotive AG, Siegburg, Fed. Rep. of Germany

Filed Jun. 19, 1991, Ser. No. 717,388

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1990, 4021746

Int. Cl.[5] F16B *2/08*

U.S. Cl. 24—20 EE **11 Claims**



1. A continuous tensioning ring for mounting convoluted boots, consisting of an annular member rolled from flat strip material so as to be round, with free ends of the strip being connected to each other in such a way that a first free end and a second free end of the strip are provided with connecting clips whose shapes are adapted to each other, and connected to each other in the strip plane so as to engage each other, comprising externally positioned connecting clips at the first free end and an internally positioned connecting clip at the second free end, said external clips, each having a claw with an engaging face in a plane at an acute angle with respect to a longitudinal axis of the strip, each embrace, and engage from behind, said internal clip having a pair of claws with engaging faces in a plane at an acute angle with respect to the strip longitudinal axis such that said internal clip claws engaging faces engage said external clip engaging faces such that the clips are aligned in such a way that when a tensile load is applied to the connection between the free ends inwardly directed forces act on the externally positioned connecting clips.

5,150,504

UNIVERSAL TETHER APPARATUS

Carl M. Cohen, Evanston, Ill., assignor to Sassy, Inc., Northbrook, Ill.

Filed May 6, 1991, Ser. No. 696,352

Int. Cl.[5] A44B *21/00*

U.S. Cl. 24—302 **20 Claims**

1. A universal tether apparatus for releasably attaching juvenile articles such as pacifiers, teething devices, rattles and toys, to the clothing worn by an infant, through releasable attachment means capable of alternatively restraining male post-type, and female loop-type, elements of said juvenile articles, said universal tether apparatus comprising:

apparatus body means having a front side, a back opposite said front side, and a peripheral edge,

said apparatus body means including said attachment means for removably attaching said apparatus body means to said clothing worn by an infant;

flexible connection means having a first end and a second end opposite said first end for operable deployment and securement between said apparatus body means and said juvenile articles; and

receiving means operably positioned on said apparatus body means for facilitating releasable affixation of at least one of said first and second ends of said flexible connection means to said receiving means,

said receiving means including post means having a top end and a bottom end opposite said top end wherein said top end projects outwardly from said apparatus body means, said top end and said bottom end forming therebetween a connection attachment region for alternatively restrainably affixing and releasing from affixation said at least one of said first and second ends of said flexible connection means,

at least said first end of said flexible connection means including post attachment means for said releasable affixation about the connection attachment region of said post means of said apparatus body means and, alternatively, releasably affixable to said male post-type element of said juvenile articles,

said second end of said flexible connection means including second attachment means for releasable affixation to said receiving means operably positioned on said apparatus body means and, alternatively, releasably affixable to said female loop-type element of said juvenile articles.

5,150,505

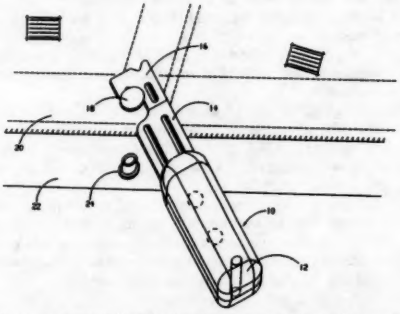
HAND TOOL FOR FASTENING SNAPS

David F. Drabek, 245 Seabury Rd., Bolingbrook, Ill. 60439

Filed Nov. 13, 1990, Ser. No. 612,888

Int. Cl.[5] B25B *27/14*

U.S. Cl. 29—278 **5 Claims**



1. A hand tool for facilitating the coupling of a male and female snap fastener member, wherein said female snap member is fixedly mounted on a substrate material, said hand tool comprising:

first means to engage in tension said female snap member attached to said substrate material,

said first means comprising a tension notch edge, said tension notch edge being capable of engaging in tension said female snap member attached to said substrate material,

second means to engage in compression said female member of a snap fastener attached to a substrate material,

said second means comprising a compression notch edge, said compression notch edge being capable of engaging in

compression said female snap member attached to said substrate material, and

handle means,

said handle means comprising a textured thermoplastic resin material formed about said hand tool so as to allow the exertion of a tensile or compressive force through said first or second means engaging said female snap member attached to said substrate material;

said first and second means being adapted to selectively apply a bi-directional force exerted through said handle means to said female snap member within a plane substantially along the plane of the said substrate material, and

said first and second means engaging said female snap member attached to said substrate material such that tensile or compressive forces exerted through said first and second means creates substantially zero rotational moments about an axis located in the transverse plane of said substrate material.

5,150,506

METHOD OF ASSEMBLING EXTERIOR PARTS OF A MOTORCAR ONTO A MOTORCAR BODY

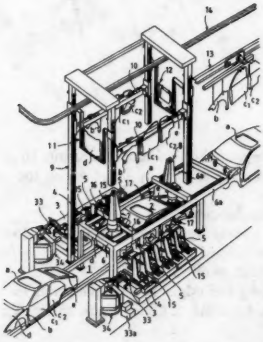
Katuo Kotake; Michihiro Kitahama; Keizaburo Otaki; Akira Miyazaki; Masayuki Abe; Shoji Okahara; Manabu Tuchida; Yukihiro Yaguchi; Hiroyuki Furuya, and Takeshi Nakamura, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1990, Ser. No. 628,880

Claims priority, application Japan, Dec. 20, 1989, 1-328397; Feb. 22, 1990, 2-39753; Mar. 5, 1990, 2-51796; Mar. 15, 1990, 2-64771; Mar. 17, 1990, 2-67764; Mar. 26, 1990, 2-75932

Int. Cl.[5] B23Q *17/00*

U.S. Cl. 29—407 **5 Claims**



1. A method of assembling exterior parts of a motorcar onto a motorcar body comprising the steps of:

measuring assembling accuracy errors of a motorcar body by measuring positions of a plurality of reference points of said motorcar body;

calculating correction data relating to respective assembling positions of plural kinds of exterior parts which form an external shape of the motorcar, said calculation being performed on the basis of measured data obtained in the previous step, while maintaining a correlative relationship among said parts, to eliminate correlative misalignment among said parts due to said assembling accuracy errors of said motorcar body; and

assembling each of said parts by respective assembling robots to a respective assembling position which has been corrected in accordance with said calculated correction data.

5,150,507

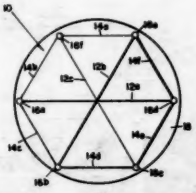
METHOD OF FABRICATING LIGHTWEIGHT HONEYCOMB STRUCTURES

Jitendra S. Goela, Andover; Michael Pickering, Dracut, and Raymond L. Taylor, Saugus, all of Mass., assignors to CVD Incorporated, Woburn, Mass.

Division of Ser. No. 389,248, Aug. 3, 1989, abandoned. This application Dec. 12, 1990, Ser. No. 626,608

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—460 **7 Claims**



1. A method of fabricating a lightweight structure from a plurality of ribs each of which have substantially the same height and thickness with the height and length greatly exceeding the thickness, with each of said ribs having a center, a first elongated edge and a second elongated edge, comprising the steps of:

(a) forming from a first set of said ribs, each of which are of substantially the same length, a hexagonal cell having a plurality of pairs of most widely spaced corners and a depth equal to the height of said ribs,

(b) forming slots in the center of first, second and third ones of a second set of said ribs which ribs are all of the same length and substantially equal to the distance between the most widely spaced corners of said hexagonal cell, with a first slot from the first elongated edge of a first one of said ribs, a second slot from the second elongated edge of said second one of said ribs, and third and fourth slots from the first elongated edge and the second elongated edge, respectively, of said third one of said ribs, with the lengths of said first and second slots being greater than half the height of said ribs and the lengths of said third and fourth slots being less than half the height of said ribs,

(c) interlocking said first, second and third ones of said second set of ribs at the centers thereof by bringing said first and second slots into cooperative relation with said third and fourth slots, respectively,

(d) positioning said interlocked first, second and third ones of said second set of ribs relatively to said hexagonal cell to connect the most widely spaced corners thereof thereby forming a structure core having six regions each of equilateral triangular cross section with each such region comprising a cell, and

(e) exposing the structure core to a vapor deposition process thereby depositing and coating thereon a stiffening and strengthening material thereby enclosing said structure core in a monolithic structure of such material.

5,150,508

HEMMING MACHINE AND METHOD

Lucen St. Denis, Windsor, Canada, assignor to E. R. St. Denis & Sons, Limited, Oldcastle, Canada

Filed Jun. 28, 1991, Ser. No. 723,383

Int. Cl.[5] B21D *39/02;* **B23P** *11/00*

U.S. Cl. 29—463 **13 Claims**

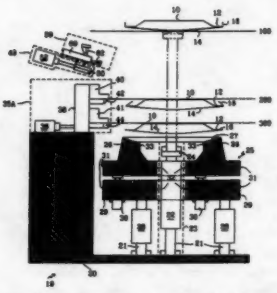
1. A machine for forming a unitary structure from a first steel panel having an upturned flange and a second steel panel having a flat edge portion, comprising:

(a) a support surface unit including a support surface for receiving said first panel and said second panel in a superimposed relation with said edge portion of said second panel proximate to said flange of said first panel;

(b) a plurality of first flange engaging members having bevelled engaging surfaces, said first flange engaging members being located at a pre-hem position;

(c) a plurality of second flange engaging members having substantially right-angled engaging surfaces, said second flange engaging members being located at a final-hem position;

(d) means for moving said support surface unit to said pre-hem position such that said flange of said first panel is pressed against said bevelled engaging surfaces of said first



flange engaging members, wherein said flange of said first panel is bent by approximately 45° with respect to the plane of said first panel to form a pre-hemmed flange;

(e) means for moving said support surface to said final hem position such that said pre-hemmed flange is pressed against said substantially right-angled engaging surfaces of said second flange engaging members, wherein said pre-hemmed flange of said first panel is bent to fully clinch said edge portion of said second panel to form said unitary structure.

5,150,509

METHOD OF PRODUCING A STABILIZED BOLT JOINT BETWEEN A TIMBER ELEMENT AND ANOTHER CONSTRUCTION ELEMENT AND THE TIMBER CONSTRUCTION

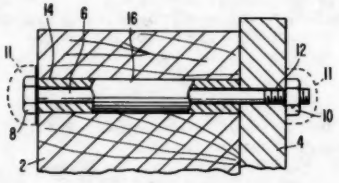
Tom L. Wils, Fruens Böge, Denmark, assignor to Kompan A/S, Denmark

Continuation of Ser. No. 672,564, Mar. 29, 1991, which is a continuation of Ser. No. 440,873, Nov. 24, 1989, abandoned, which is a continuation of Ser. No. 124,681, Nov. 23, 1987, abandoned, which is a continuation of Ser. No. 730,189, May 3, 1985, abandoned. This application Oct. 1, 1991, Ser. No. 769,224

Claims priority, application Denmark, May 3, 1984, 1293/84

Int. Cl.[5] B23P *11/02*; **F16B** *43/02*

U.S. Cl. 29—525.1 **20 Claims**



1. A method of joining a timber element with at least one construction element by a clamping bolt, each of said timber element and the at least one construction element having at least on through hole therein for accommodating the clamping bolt, a diameter of the through hole in the timber element is oversized relative to a diameter of the clamping bolt, the method comprising the steps of mounting a rigid inflexible lining bushing having two interconnected opposed end portions and formed of a hard and substantially non-shrinkable pressure-resistant material in the through hole in the timber element with a tight fit therein and with a length substantially corresponding to an axial length of the through hole in the timber element, joining the timber element and the at least one construction element together by a tightening of the clamping bolt projecting through the lining bushing such that opposed end portions of the rigid lining bushing are acted upon by a tightening pressure of said clamping bolt with the portion of the hard and substantially non-shrinkable pressure-resistance material of the rigid lining bushing interconnecting the end portions being substantially nondeformed by the tightening pressure of the clamping bolt so that the timber element and the at least one construction element, upon a shrinking of the at least one timber element are mutually held by engagement with the lining bushing.

5,150,510

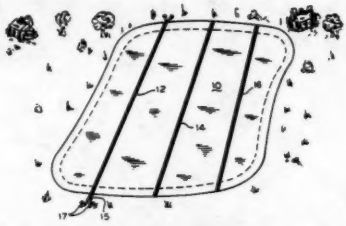
METHOD OF MANUFACTURING LARGE SCALE MEMBRANES FOR COVERING EXTREMELY LARGE AREAS

Jack Moreland, Dolton, Ill., assignor to MPC Containment Systems, Ltd., Chicago, Ill.

Continuation of Ser. No. 886,917, Jul. 16, 1986, Pat. No. 4,987,657, which is a continuation of Ser. No. 523,657, Aug. 15, 1983, Pat. No. 4,641,400. This application Dec. 27, 1990, Ser. No. 634,418

Int. Cl.[5] B23P *11/02*

U.S. Cl. 29—525.1 **6 Claims**



1. A two-step method of manufacturing large scale membranes for covering extremely large areas, the method comprises:

step one, in a factory:

(1) making a plurality of panels of industrial strength fabric which are shaped and proportioned to be fitted together to make said membrane;

(2) reinforcing the edges of said panels at least in the area where said panels confront each other when fitted together;

(3) forming a plurality of non-contiguous spaced apart areas in association with said reinforced edges, said spaced apart areas being at locations where said panels may be mechanically joined to each other;

(4) bonding a plastic slide closure means to each of said panels at a location which is parallel to said edges, said bonding to said panel enabling said slide closure to complete a waterproof surface between said panels and across said edges including said spaced apart areas;

(5) shipping said panels to an installation site;

step two, in the field at said installation site:

(6) laying out said panels in the form of said membrane;

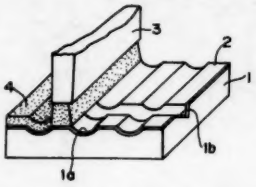
(7) mechanically joining said panels to each other by adding mechanical couplings at each of said spaced apart areas; and

(8) closing said plastic slide closure means to form said waterproof surface across a seam in said membrane which is formed by said mechanical couplings.

5,150,511
METHOD FOR MANUFACTURING A MAGNETIC TRANSDUCER HEAD

Katsumi Sakata; Tatsuo Kumura; Atsushi Suzuki; Yoshito Ikeda; Kaoru Aoki; Naoto Kojima, all of Miyagi, and Akio Mishima, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 31, 1991, Ser. No. 708,388
Claims priority, application Japan, May 31, 1990, 2-143093
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—603 **18 Claims**



1. A method for manufacturing a magnetic transducer head, comprising the steps of:

providing a pair of magnetic core members shaped to provide a magnetic gap extending up to a tape running surface of the head when they are bonded together, said magnetic gap having a width corresponding to a recording track width on a travelling magnetic recording medium, said width being smaller than a thickness of said core members;

providing in each magnetic core member a groove at each opposite end of the magnetic gap so as to define said width of the magnetic gap corresponding to said recording track width, said grooves running towards and terminating at said running surface of the head;

blowing with air pressure nonmagnetic powder material into said grooves such that the powder material creates a deposition which fills said grooves but not said gap;

removing excess nonmagnetic powder alongside said grooves so that substantially no nonmagnetic powder is present in said gap; and

bonding the core members together in a relatively low temperature process which does not substantially affect magnetic characteristics of the core members.

5,150,512
METHOD OF ASSEMBLING A DISK FILE

Michael R. Hatchett, Chandlers Ford; Anthony R. Hearn, South Wonston, and Charles M. Lacey, Emsworth, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/GB89/00267, § 371 Date Nov. 13, 1990, § 102(e) Date Nov. 13, 1990, PCT Pub. No. WO90/10934, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 15, 1989, Ser. No. 602,241
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—603 **7 Claims**

1. A method of assembling a disk file in which information is recorded on and read from a stack of disks (11) during rotation thereof by means of air bearing magnetic heads (27) supported on resilient suspensions (28) in a head arm stack (13) and positionable over selected tracks of the disks by means of an actuator mechanism on which the head arm stack is mounted to form an actuator assembly (12), both disk stack and actuator assembly being mounted on a common base (10),

the method comprising the steps of:

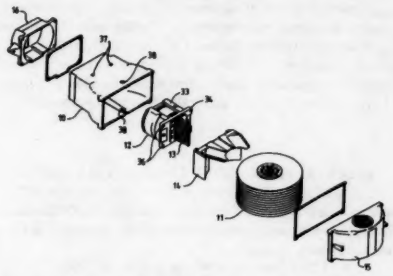
pre-assembling such a disk stack assembly and such an actuator assembly;

temporarily collapsing the head suspensions (28) of the actuator assembly;

temporarily supporting the pre-assembled actuator assembly and disk stack assembly for relative movement towards each other;

measuring and adjusting the relative position of the actuator assembly and the disk stack assembly in a direction parallel to the disk axis of rotation so that the collapsed heads are aligned with the spaces between the disks;

merging the actuator assembly with the disk stack by relative movement so that said heads enter the spaces between the disks;



releasing the heads to contact the disk surfaces;

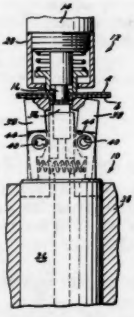
registering the common base with the merged disk stack and actuator assembly in the position it will adopt in the finished product; and

fastening the common base, actuator assembly and disk stack assembly together.

5,150,513
APPARATUS FOR JOINING SHEET MATERIAL

Edwin G. Sawdon, St. Clair, Mich., assignor to BTM Corporation, Marysville, Mich.

Division of Ser. No. 468,579, Jan. 23, 1990, Pat. No. 5,027,503, which is a division of Ser. No. 175,941, Mar. 31, 1988, Pat. No. 4,910,853, which is a division of Ser. No. 853,130, Apr. 17, 1986, Pat. No. 4,757,609, which is a continuation-in-part of Ser. No. 607,948, May 7, 1984, abandoned, which is a division of Ser. No. 495,440, May 17, 1983, Pat. No. 4,459,735, which is a continuation of Ser. No. 184,951, Sep. 8, 1980, abandoned. This application May 1, 1991, Ser. No. 694,141
The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.
Int. Cl.[5] B23Q *1/00*
U.S. Cl. 29—798 **1 Claim**



1. An apparatus for joining sheet material, comprising:

punch means;

a number of die portions defining an opening in said apparatus for receiving said punch means, said punch means and said die portions being movable relative to one another in a generally longitudinal direction;

fixed anvil means located in said opening;

die movement means providing for movement of said die portions away from one another in response to said punch means compressing the sheet material against said anvil means and causing the sheet material to deform generally laterally outwardly in said opening;

die engagement portions longitudinally fixed relative to said fixed anvil means on said apparatus for longitudinally supporting said die portions in slidable engagement with said die engagement portions during said movement of said die portions away from one another; and

biasing means for resiliently urging said die portions in a generally outward lateral direction in order to resiliently bias said die portions generally toward one another.

5,150,514

CORRUGATING ROLL UNIT EXCHANGING APPARATUS FOR A SINGLE FACER

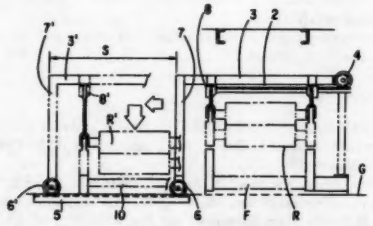
Yukuharu Seki; Hiroaki Sasashige, and Haruo Ohkawa, all of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1991, Ser. No. 643,299

Claims priority, application Japan, Jan. 22, 1990, 2-3864

Int. Cl.*[5] B21B *31/08

U.S. Cl. 29—824 **9 Claims**



1. A corrugating roll unit exchanging apparatus for exchanging a corrugating roll unit in a single facer in a corrugating machine, wherein the corrugating roll unit includes at least one corrugating roll having a longitudinal axis, said exchange apparatus comprising:

(a) guide rail means disposed horizontally above said single facer and extending in a direction substantially parallel to said longitudinal axis of said corrugating roll;

(b) a beam means having at least a first end and a second end, said first end being supported along said guide rail means, said second end being supported by a support means, said support means and said beam means being horizontally movable in a direction substantially parallel to the longitudinal axis of said corrugating roll; and

(c) suspension means mounted to said beam means for suspending said corrugating roll unit.

5,150,515

KINETIC WHEEL ALIGNMENT SYSTEM AND METHOD

M. Stanley Merrill, Denver, and Thomas B. Chapin, Lakewood, both of Colo., assignors to Merilab, Inc., Englewood, Colo.

Filed Mar. 12, 1991, Ser. No. 667,980

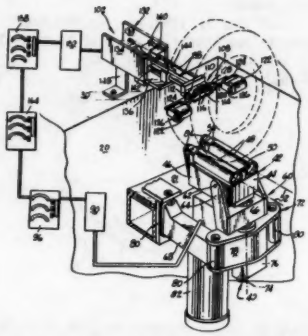
Int. Cl.[5] **G01B** *7/315, 5/255*

U.S. Cl. 33—203.12 **8 Claims**

5. A method for auditing the tires of a vehicle, comprising the steps of:

(a) positioning a wheeled vehicle on a vehicle wheel alignment system having a first aligning means including means for measuring at least the toe angle of the wheels with reference to the sidewall of the tires of the wheels for aligning said wheels, and said wheel alignment system having a second aligning means including means for measuring at least the toe angle of the wheels with reference to the tread of the tires of the wheels for aligning said wheels;

(b) obtaining measurements from each of the first aligning means and the second aligning means; and



(c) obtaining a number which is the difference between said measurements, said number being used for auditing the tires.

5,150,516

PROCESS FOR MAKING DETACHABLE CONNECTING MEANS FOR RIBBON OPTICAL FIBER CABLES AND THE CONNECTING MEANS OBTAINED THEREBY

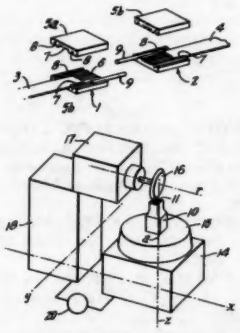
Paolo Boero, Milan, and Bruno Bortolin, Cinisello Balsamo, both of Italy, assignors to Societa' Cavi Pirelli S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 555,907, Jul. 20, 1990, Pat. No. 5,037,179. This application Sep. 11, 1990, Ser. No. 580,590

Claims priority, application Italy, Sep. 28, 1989, 21866 A/89

Int. Cl.[5] **H01R** *43/00;* **B21D** *35/00*

U.S. Cl. 29—877 **7 Claims**



1. A process for making a connector for connecting optical fibers of a ribbon cable having a number of longitudinally extending, parallel optical fibers greater than one therein to optical fibers of a like cable, said connector being interchangeable with and connectible to another like connector and having a pair of opposed metal plates, at least one of said plates having a face facing a face of the other of said plates and having a plurality of parallel grooves therein at least equal in number to the number of optical fibers to be interconnected, said process comprising:

providing a punch body with a punch face having a plurality of parallel ridges which are dihedral in cross-section and which correspond to said grooves, said punch body hav-

ing a longitudinal axis perpendicular to said punch face and said ridges being symmetrically disposed with respect to a plane co-incident with said longitudinal axis, said ridges being formed, at least in part, by grinding said punch face in successive passes with relative movement of a grinding means and said punch face parallel to said ridges and intermediate one or more passes by rotating said punch face around said longitudinal axis; and

forming said grooves in at least said one of said plates by pressing said punch face against said face of said one plate and causing plastic flow of the metal of said one plate corresponding to said grooves;

whereby said grooves formed in said metal plates correspond to said ridges of said punch face.

5,150,517

METHOD OF MANUFACTURING A PISTON

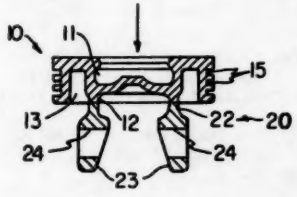
Jose M. Martins Leites; Jose A. Cardosomendes; Andre Lippai, all of Sao Paulo, and Paulo T. Dellanoce, Sao Caetano Do Sul, all of Brazil, assignors to Metal Leve S/A Industria E Comercio, Sao Paulo, Brazil

Filed Apr. 16, 1991, Ser. No. 687,468

Claims priority, application Brazil, Apr. 17, 1990, PI 9001859

Int. Cl.[5] B23P *15/10*

U.S. Cl. 29—888.04 **5 Claims**



1. Method of manufacture of a piston of the articulated type, comprising a head with a top portion and a pin boss portion with at least one pin boss and a skirt independent from the said head and mounted on the at least one pin boss by means of a wrist pin bearing in a hole provided on the at least one pin boss, wherein the head is made in accordance with the following steps:

a. subjecting a first metal blank having a substantially cylindrical cross section to machining operations to define an upper combustion bowl, a lower circumferential groove and a lower central recess;

b. subjecting a second metal blank to machining operations to define a circumferential central recess on one of the ends of said blank and narrowing the cross section of said blank around said circumferential central recess thereby defining a collar;

c. bringing the top face of collar in facing relationship with the lower end of the inner wall of said circumferential groove and joining the first and second metal blanks together to form the head;

d. subjecting the head to final machining operations to define ring grooves, the at least one pin boss portion and the holes for the pin boss portion.

5,150,518

PROCESS FOR MANUFACTURING INNER AND OUTER PARTS FOR A ROTARY PISTON MACHINEIN WHICH THE INNER AND OUTER PARTS HAVE PARALLEL AXES

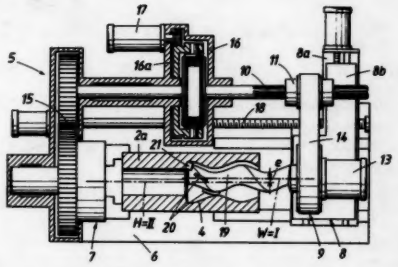
Erwin Fuchs, Altmünster, Austria, assignor to Weingärtner Maschinenbau Gesellschaft m.b.H., Kirchham, Austria

Filed Mar. 22, 1991, Ser. No. 673,956

Claims priority, application Austria, Mar. 29, 1990, 728/90

Int. Cl.[5] B23P *15/10*

U.S. Cl. 29—888.04 **2 Claims**



1. A process for manufacturing inner and outer parts of a rotary piston machine, the inner and outer parts having respective axes extending parallel to, and spaced apart from each other, and having respective outer and inner interengaging helical surfaces, the surfaces having convolutions differing in number by one, and the parts being operable to rotate and to revolve eccentrically about the axes thereof relative to each other in a basic operating movement, which process comprises machining the interengaging surface of either the inner or the outer part with a cutting tool rotating about an axis extending parallel to the axis of the part, the cutting tool having cutting teeth at an end face thereof and on a peripheral surface thereof, and the cutting teeth on the peripheral surface being arranged to conform in shape to the surface of the part, the machining being effected by a compound movement of the tool and the part relative to each other, the compound movement being composed of a movement simulating the basic operating movement of the part and a superposed movement of the cutting teeth on the surface of the part along a helical path simulating the shape of the helical surface.

5,150,519

METHOD FOR PRODUCING A LOCKED, TIGHT PIPE-CONNECTION

Heinz Unewisse, Mülheim, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 12, 1991, Ser. No. 685,401

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1990, 4012504

Int. Cl.[5] B23P *11/00*

U.S. Cl. 29—890.14 **11 Claims**

1. A process for making a permanent, tight pipe joint between a pipe end and a press fitting surrounding the pipe, the press fitting having a stop on the inside at some distance from an open end for receiving the pipe, said process comprising the steps of:

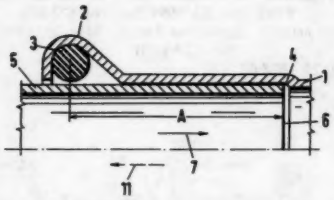
providing relative movement between the pipe and the press fitting to axially engage the pipe with the press fitting;

disposing a pressing tool around the press fitting, the pressing tool for pressing the press fitting and the pipe together to form a joint;

applying an axial force between the pipe and the press fitting, said axial force being in the engagement direction of the pipe and the press fitting;

preventing the pressing action of the pressing tool for the

pressing of the press fitting until there is a substantial increase in said axial force, being applied between the pipe and the press fitting, to a value greater than a first force; and



releasing the pressing action of the pressing tool for the pressing of the press fitting when said axial force being applied between the pipe and the fitting assumes a value greater than said first force.

5,150,520

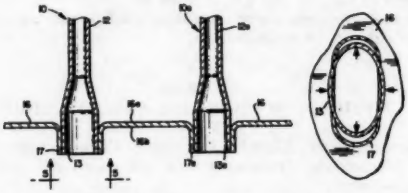
HEAT EXCHANGER AND METHOD OF ASSEMBLY THEREOF

Joseph F. DeRisi, Hamden, Conn.; assignor to The Allen Group Inc., New Haven, Conn.

Continuation-in-part of Ser. No. 450,677, Dec. 14, 1989, abandoned. This application Feb. 19, 1991, Ser. No. 657,422

Int. Cl.[5] **B21D** *39/06;* **B23K** *31/02*

U.S. Cl. 29—890.013 **7 Claims**



1. A method of securing a plurality of oval tubes to a plurality of oval openings in the wall of a header in a heat exchanger comprising the steps of:

(a) sizing the ends of said oval tubes or header openings such that the minor diameter of the tube ends is greater than the minor diameter of the header openings and the major diameter of the tube ends is less than the major diameter of the header openings, the circumference of said tube ends and said header openings being substantially equal;

(b) inserting said tube ends into corresponding openings in said header wall whereupon the minor diameter of said tube ends is reduced and the major diameter of said tube ends is increased to create a substantially fully contacting fit around the circumference with said header openings; and

(c) bonding said tube ends to corresponding openings in said header wall to form a plurality of bonded tube-to-header joints.

5,150,521

NAIL COLLECTION BOX FOR A NAIL CLIPPER

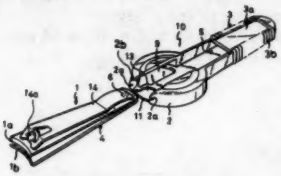
Kyung Soo Han, Seoul, Rep. of Korea, assignor to Chi K. Chang, Houston, Tex.

Filed Feb. 12, 1992, Ser. No. 834,349

Claims priority, application Rep. of Korea, Feb. 12, 1991, 2133/1991[U]

Int. Cl.[5] **A45D** *29/00, 29.18*

U.S. Cl. 30—28 **6 Claims**



1. A nail collection box assembled or disassembled with nail clipper comprising:

a nail collecting portion having a cylindrical configuration, said nail collection box including a front opening, at least one bottom opening, and a pair of slits formed in a pair of side walls of said front opening in line with a gap between upper and lower cutting jaws of said nail clipper,

a handle portion extending said collecting portion, said handle portion including a hollow interior space for conforming to the exterior configuration of a body of said nail clipper so as to receive said body and an engaging protrusion disposed at the rear end of the bottom surface thereof for being adapted to engage with a locking hole disposed at the rear end of an outer cutting jaw member of said body of the nail clipper, and

a separate concave collector for easily engaging with and disengaging from said collecting portion.

5,150,522

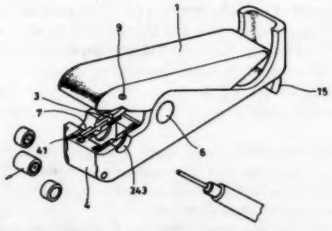
COAXIAL CABLE STRIPPER WITH MEANS TO REMOVE INSULATOR CHIPS

Liaw Gwo-Jiang, No. 44, Chung Cheng Rd.,, Hsin Chuang City, Taiwan

Filed Dec. 3, 1991, Ser. No. 801,225

Int. Cl.[5] **H02G** *1/12*

U.S. Cl. 30—91.2 **2 Claims**



1. A coaxial cable stripper comprising:

a pressure bar, said pressure bar comprising two vertical side walls at two opposite sides, a receiving chamber at one end, and a curved tail at an opposite end, the two vertical side walls of said pressure bar each having an axle hole aligned with each other and a curved edge at a suitable location, the receiving chamber of said pressure bar having two recessed portions and two axle holes at two opposite sides;

a base pivoted to said pressure bar, said base comprising two vertical side walls at two opposite sides, a second receiving chamber at one end, and an opening at an opposite

end, the two vertical side walls of said base each having an axle hole aligned with each other, the receiving chamber of said base having two opposite grooves at two opposite sides, a gap at the front, two opposite axle holes aligned at two opposite sides, and two opposite curved notches on the two opposite top edges thereof;

a crank holder fastened in the receiving chamber of said pressure bar, said crank holder comprising two opposite flanges at two opposite sides respectively retained in said recessed portions, a crank at one end, an axle hole longitudinally aligned with the two axle holes on the receiving chamber of said pressure bar;

a cutter holder fastened in the receiving chamber of said base, said cutter holder having a plurality of slots, a plurality of cutters fastened in said slots, said cutters each having a notch on the cutting edge thereof, a recessed hole at the middle for moving said crank, a bottom flange engaged into said gap, an axle hole through said bottom flange aligned with the two opposite axle holes on the receiving chamber of said base and locked in place by a lock pin, and two side rails at two opposite sides respectively engaged in the two opposite grooves in the receiving chamber of said base; and

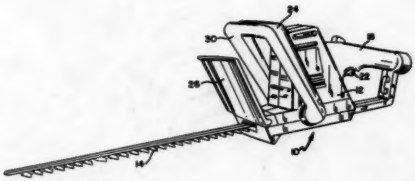
a spring retained between said pressure bar and said base, said spring having two opposite loops at the middle secured to the axle holes on the two vertical side walls of said pressure bar and the axle holes on the two vertical side walls of said base by a lock pin.

5,150,523

DEADMAN SWITCH ARRANGEMENT FOR A HEDGE TRIMMER

Ronald C. McCurry, West Union, S.C., assignor to Ryobi Motor Products Corporation, Easley, S.C.

Filed Jul. 11, 1991, Ser. No. 728,374
Int. Cl.[5] B26B *15/00*; B27B *17/00, 17/02*
U.S. Cl. 30—228 **4 Claims**



1. In a hedge trimmer having a housing, a motor supported within said housing, a cutting blade extending forwardly from said housing and driven by said motor, a main handle secured to said housing and extending rearwardly therefrom, a primary power switch having an actuator supported in proximity to said main handle and in circuit with said motor for selectively controlling the application of power thereto, and an auxiliary bailtype handle supported on said housing between said main handle and said cutting blade, a deadman switch arrangement comprising:

normally open secondary switch means in circuit with said primary power switch for preventing power from being supplied to said motor when said secondary switch means is open, said secondary switch means having an actuator pin yieldably biased in a first direction to allow said secondary switch means to remain open, movement of said actuator pin in a direction opposite said first direction causing said secondary switch means to close;

means for supporting said secondary switch means in said housing with said actuator pin extending through an opening in said housing;

a cover member mounted for pivoting movement on said auxiliary handle within an angular range between a first position where said cover member closely overlies said auxiliary handle and a second position where said cover member is angularly spaced from said auxiliary handle;

means for yieldably biasing said cover member toward said second position; and

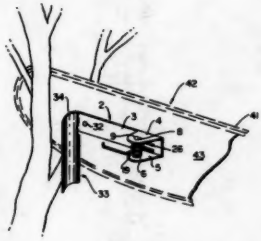
actuating means mounted on said cover member for engaging said secondary switch means actuating pin and moving said secondary switch means actuating pin in said opposite direction to close said secondary switch means as said cover member is moved from said second position toward said first position.

5,150,524

BRUSH DEFLECTOR ATTACHMENT FOR CHAIN SAW

James A. Hall, 6197 W. Wagstaff Rd., Paradise, Calif. 95969

Filed Aug. 12, 1991, Ser. No. 743,610
Int. Cl.[5] B23D *59/00*; B27B *17/00*
U.S. Cl. 30—382 **12 Claims**



1. A safety attachment for a chain saw having a chain guide in the form of an elongated metal plate extending from a chain saw housing longitudinally along a longitudinal axis to support the upper and lower reaches of a chain, said safety attachment prevents the lower reach of the chain from whipping small diameter flexible branches sought to be cut toward an operator, comprising:

a) a base member detachably latchable to the chain guide adjacent the end thereof remote from the housing and latchable against movement relative to the chain guide when the chain saw is in use;

b) means on the base member manipulable to selectively latch or unlatch the base member from the chain guide; and

c) deflector means mounted on the base member and adapted to project from the base member perpendicularly to the longitudinal axis and spaced rearwardly of the chain guide end remote from the housing and below the lower reach of the chain when the chain saw is in use with the safety attachment latched thereon whereby small diameter flexible branches impelled rearwardly toward an operator by the lower reach of the chain impinge upon the deflector means and are stopped from striking an operator.

5,150,525

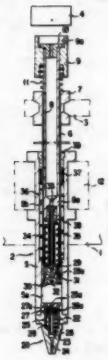
DRAWING DEVICE FOR USE IN DRAFTING MACHINE

Kenichiro Iai, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 20, 1991, Ser. No. 672,574
Claims priority, application Japan, Mar. 20, 1990, 2-27625
Int. Cl.[5] B43L *13/00*
U.S. Cl. 33—18.1 **2 Claims**

1. A drawing device for use in a drafting machine including one length of long casing fixedly secured to a base serving as a holder, said casing having a leading end and a rear end; a lead guide fixedly secured to the leading end of the casing; one length of long pipe member inserted into said casing from said rear end of said casing in such a manner as to be axially slidably moved freely; a chuck ring fixedly secured to the interior of a

leading end portion of the pipe member; a sleeve fitted closely over and fixedly secured to the outer peripheral surface of an end side portion of said pipe member, said sleeve being connected to a driving arrangement; one length of a lead stock having a leading end inserted into said pipe member in such a manner as to be slidably moved freely and in opposed relationship to a rear end of said chuck ring, said lead stock having a centrally and axially extending lead insertion hole formed in a leading end side thereof, and also a lead stock space formed therein so as to extend axially from the lead insertion hole to a rear end side of said casing; a lead chuck fixedly secured to the leading end of said lead stock in such a manner that a leading end side portion of said lead chuck may be radially deformed or expanded and contracted in cooperation with said chuck ring, said lead chuck having a centrally extending lead insertion hole formed therein and in aligned relationship with the lead insertion hole in the lead stock; a compression coiled spring mounted between said chuck ring and said lead stock so as to bias normally said lead stock and said lead chuck, toward the rear end of said casing, in a longitudinal direction relative to said pipe member and said chuck ring; and means for radially deforming or contacting the lead chuck to enable the lead stock to hold a lead firmly when said lead chuck is biased by resilient force of the coiled spring; a regulating piece fitted over a rear end of said lead stock in such a manner as to be slidably moved freely by a predetermined stroke, an auxiliary compression coiled spring mounted between said regulating piece and said sleeve so as to normally bias the regulating piece towards the rear end of said lead stock, and a knocker provided movably up and down above said regulating piece so as to move said regulating piece down.



5,150,526

Patent Not Issued For This Number

5,150,527

GUN SIGHTING ARBOR

Richard G. Knoster, R.D. 2, Box 211, New Paris, Pa. 15554

Filed May 21, 1991, Ser. No. 703,373

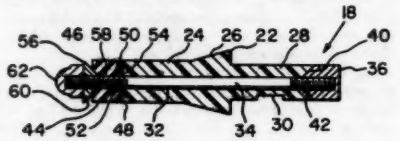
Int. Cl.[5] F41G *1/54*

U.S. Cl. 33—234 **15 Claims**

1. An arbor for securing a sighting device to a firearm having a barrel with a muzzle, said arbor comprising:

A body having a front portion, a conical intermediate portion, rear portion and an axial throughbore;

a shaft having a first end and a second end journaled in said throughbore and having a threaded portion at each end;



a knob threaded on said first end of said shaft adjacent said rear portion of said body;

a resilient plug slideably carried on said shaft adjacent said front portion of said body, said plug having a radially expandable rim on an end opposite said front portion;

a recessed plug seat formed in the front portion of said body for receiving said plug;

a travelling spreader disk carried on the threaded portion of said shaft adjacent said plug;

an end nut threaded on said second end of said shaft; and

means on said rear portion of said body for securing a sighting device to said arbor;

wherein said plug and said front portion are received by the barrel, said conical portion engages the muzzle, and said knob may be rotated to draw said spreader disk toward said body to expand said plug and secure said arbor concentrically within the barrel.

5,150,528

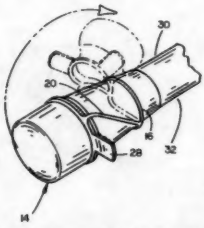
SCOPE COVER

Michael H. Shire, Belgrade, Mont., assignor to Quake Industries, Inc., Belgrade, Mont.

Filed Mar. 25, 1991, Ser. No. 675,530

Int. Cl.[5] G02B *23/16*; F41A *35/02*

U.S. Cl. 33—244 **2 Claims**



1. A scope cover for a scope having opposite ends comprising,

a resilient attachment ring;

a pair of spaced-apart, resilient attachment bands extending from said ring in substantially the same plane as said ring,

a resilient, cup-shaped cover means having an inner open-end and outer end,

said bands being secured to the inner end of said cover means,

said ring having sufficient resiliency to permit it to be stretched and positioned around one end of the scope,

said cover means having sufficient resiliency to permit it to be stretched and positioned over said one end of the scope,

said bands of such a length and resiliency and located to permit said cover means to be stretched and moved away from said attachment ring so that said cover means may be positioned on top of the scope and in engagement therewith adjacent to said one end,

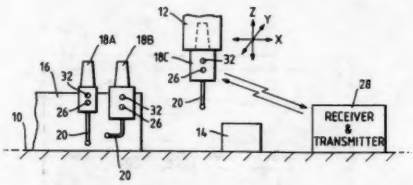
said bands extending downwardly from said ring, when said ring is mounted on the scope, and are bent upwardly from the ring when the cover means is placed in an inoperative position on top of the scope.

5,150,529

SIGNAL TRANSMISSION SYSTEM FOR MACHINE TOOLS, INSPECTION MACHINES, AND THE LIKE

David Collingwood, Kings Stanley, United Kingdom, assignor to Renishaw plc, Gloucestershire, United Kingdom

Filed Apr. 7, 1989, Ser. No. 334,536
Claims priority, application United Kingdom, Apr. 12, 1988, 8808611; Apr. 12, 1988, 8808612
Int. Cl.[5] G01B 5/03; G08C 19/26
U.S. Cl. 33—503 9 Claims



1. A machine tool signal transmission system comprising:

a plurality of battery-powered wireless sensor signal transmitting means, each having receiving means for receiving a given switch-on signal and means for switching on the battery power upon receipt of that given switch-on signal, and

means remote from the sensor signal transmitting means for generating and transmitting a plurality of given switch-on signals, one given switch-on signal for each sensor signal transmitting means, each given switch-on signal having a unique characteristic for each sensor signal transmitting means,

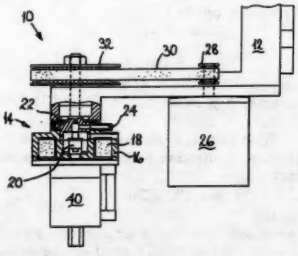
said receiving means on each sensor signal transmitting means having means responsive to the unique characteristic of the given switch-on signal associated with that sensor signal transmitting means for switching on the battery power in response thereto, but not reacting to other given switch-on signals for other sensor signal transmitting means in said plurality of sensor signal transmitting means.

5,150,530

TOOL EXCHANGE SYSTEM FOR HYBRID DIE BONDER

Karl Schweitzer, Mitte, and Gerhard Zeindl, Munster, both of Austria, assignors to Emhart, Inc., Newark, Del.

Filed Feb. 27, 1991, Ser. No. 661,888
Claims priority, application United Kingdom, Mar. 16, 1990, 9006037
Int. Cl.[5] B23B 49/00
U.S. Cl. 33—626 4 Claims



1. A hybrid die bonder comprising

a tool bank supporting a plurality of tool holders each including a tool defining a pick up axis and a magnetic body,

a pick up head adapted to sequentially pick up said tool holders,

said pick up head including magnetisable means so that a tool holder can be secured thereto,

means for aligning said axis and preventing relative rotation about said axis when a tool holder is magnetically secured to said pick up head, and

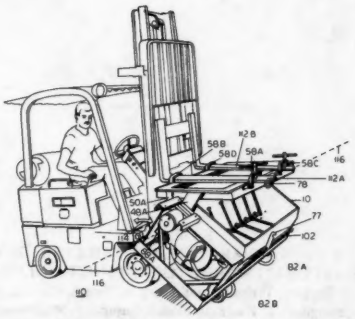
means for rotating said pick up head.

5,150,531

SLUDGE DRYING APPARATUS AND METHOD

William J. Meglio, Monroeville, Pa., assignor to Keystone Rustproofing, Inc., Arnold, Pa.

Filed Jun. 5, 1991, Ser. No. 710,540
Int. Cl.[5] F26B 3/22
U.S. Cl. 34—11 11 Claims



8. A method for drying industrial and other sludge comprising the steps of:

loading a mass of industrial and other sludge into a sludge drying box;

mixing said industrial and other sludge in said sludge drying box by rotation of a mixing shaft attached laterally within a mixing tub for rotary motion of said industrial and other sludge wherein said mixing shaft has a plurality of mixing forks fastened perpendicular and axially to said mixing shaft, said mixing forks being interspersed with a plurality of stationary mixing pins fastened vertically at a lowermost point of a bottom surface area of said mixing tub;

simultaneously with said mixing of industrial and other sludge heating said industrial and other sludge over a timed period until said industrial and other sludge reaches dehydrated and compact status;

disposing said industrial and other sludge by lifting said sludge drying box vertically and releasing said mixing tub for pivoting to a disposing position by gravitational force for unloading said industrial and other sludge.

5,150,532

LID MEMBER HAVING A FILTER MEDIUM FOR A SPIN DRYER

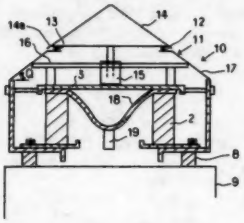
Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Tokyo, Japan

Filed Oct. 2, 1991, Ser. No. 769,796
Claims priority, application Japan, Oct. 4, 1990, 2-104050[U]
Int. Cl.[5] F26B 17/24
U.S. Cl. 34—58 3 Claims

1. A lid member having a filter medium therein mounted on a spin dryer body for filtering air drawn into the spin dryer body, wherein the lid member comprises:

a top convex surface having an upper portion and a lower portion, wherein said upper portion is vertically movable between a closed position and an open position, and wherein a gap through which air can be introduced is

formed between said upper portion and said lower portion when said upper portion is in the open position; and



actuator means for activating said upper portion so as to open and close said gap.

5,150,533

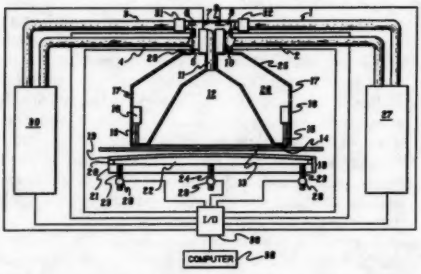
SINGLE UNIT APPARATUS FOR CHILLING, DRYING AND INCUBATING PHOTOGRAPHIC EMULSIONS

Duane J. Furling, Webster, and Gary A. Smith, Greece, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 22, 1992, Ser. No. 823,919

Int. Cl.[5] F26B *19/00*

U.S. Cl. 34—62 **5 Claims**



1. An apparatus for curing photographic emulsions comprising:

(a) a single chamber having walls and a top integral therewith, a floor discontinuous with at least two of said walls; said chamber having provision for the ingress and egress of an airflow;

(b) said floor being in the form of a platen disposed so as to provide a channel for a photographic emulsion-coated web interposed between said platen and said chamber walls;

(c) means for heating and cooling said platen;

(d) means for urging said photographic emulsion-coated web into substantially uniform contact with said platen;

(e) means for delivering air of predetermined temperature, humidity and flow rate into said chamber; and

(f) control means for regulating the temperature of said platen, and for regulating the delivery of said air of predetermined temperature, humidity and flow rate.

5,150,534

APPARATUS FOR THE BILATERAL BLOWING ONTO A WEB-LIKE OR SHEET-LIKE MATERIAL

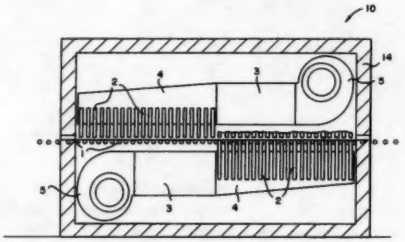
Carl Kramer, Aachen, Fed. Rep. of Germany, assignor to WSP Ingenieurgesellschaft fur Warmetechnik, Stromungstechnik und Prozesstechnik mit beschrankter Haftung, Aachen, Fed. Rep. of Germany

Filed Mar. 19, 1991, Ser. No. 671,241

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1990, 4010280

Int. Cl.[5] F26B *13/00*

U.S. Cl. 34—155 **11 Claims**



1. An apparatus for the bilateral blowing of a treatment gas onto a sheet material moving in a substantially linear direction through a treatment chamber, comprising:

a treatment space for the sheet material comprising a unit length of said treatment chamber;

a plurality of nozzle ribs arranged on both sides of the sheet material in the treatment space for introducing the treatment gas into the treatment space, said nozzle ribs being parallel to a plane of the sheet material and normal to the direction of movement of the sheet material; and

radial fans arranged on both sides of the sheet material in a space adjacent each edge of the sheet material in the treatment space for generating a stream of treatment gas supplied to said nozzle ribs at one edge of the sheet material in the treatment space and for recirculating the treatment gas from the treatment space adjacent the opposite edge of the sheet material, each of said radial fans comprising a radial fan installed in a 360° spiral housing with the axis of rotation of said fan parallel to the sheet material and perpendicular to the direction of movement of said sheet material, two radial fans on each side of the sheet material are arranged point-symmetrically at 180° relative to a reference line traversing the sheet material at the center of said treatment space and each radial fan blows into a blow-out duct extending longitudinally at one side of the treatment space adjacent one edge of the sheet material, each blow-out duct includes a first region of substantially constant cross-section and a distributor piece downstream of said first region, and said plurality of nozzle ribs are attached in fluid communication with one of said distribution pieces.

5,150,535

AIR MIXER APPARATUS

Gerold Fleissneer, Aspermontstr. 28, Chur CH-7000, Switzerland

Filed Oct. 1, 1990, Ser. No. 591,366

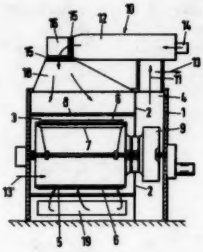
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1989, 3932837

Int. Cl.[5] F26B *13/00*

U.S. Cl. 34—155 **12 Claims**

1. An apparatus comprising an air mixer arranged in the flow direction of an at least partially heated air stream within an air flow duct in front of a heat chamber, for drying lengths of textile material, and provided for mixing air strata of differing temperatures present in the air stream, said air mixer compris-

ing a plurality of air deflection and turbulence generating sections arranged in series in the flow duct, characterized in



that in each section several mutually parallel-arranged air deflecting plates are arranged to extend over the entire cross section of the flow duct.

5,150,536

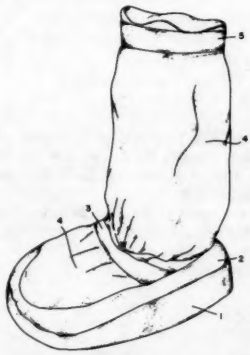
WINTER WEATHER FOOTWEAR ARTICLE

Molly Strong, 205 South Ferndale Dr., Big Fork, Mont. 59911

Filed Jan. 9, 1990, Ser. No. 462,637

Int. Cl.[5] A43B *3/16*

U.S. Cl. 36—7.10 R **18 Claims**



1. A winter weather footwear article comprising a single sole piece, an over-sized insole and means for removably securing and, optionally, adjustable tightening said article to the wearer, wherein said single sole piece consists of a layer of synthetic felt material woven by a needle punch technique, which is porous, breathable and pliable, and wherein said single sole piece covers the entire bottom surface of said footwear article and wherein said over-sized insole comprises at least one layer of closed-cell foam material which has an indented portion on the top of the insole roughly in the shape of the bottom of the shoe or boot over which the footwear article is worn, which has a flat heel, and which significantly extends outside the indented area on the sides, heel and toe such that the surface area of the bottom of the insole, which is flat, is significantly greater than the surface area of the indented portion; wherein said insole is placed inside, and optionally attached to, the inner surface of the sole piece in a manner such that the sole piece layer covers the entire bottom of the insole and, also, wraps around the side of the insole at the sides, heel and toe such that the sole piece takes on a concave shape and the surface area of the sole piece which contacts the surface when worn is significantly greater than the surface area of said indented portion.

5,150,537

SECURING AND ADJUSTER DEVICE, PARTICULARLY FOR SKI BOOTS

Maurizio Tacchetto, Noventa Padovano; Claudio Zorzi, Silea; Giuseppe De Bortoli, Montebelluna; Alessandro Pozzobon, Paderno Di Ponzano Veneto, and Renato Serafin, Vedelago, all of Italy, assignors to Nordica S.p.A., Montebelluna, Italy

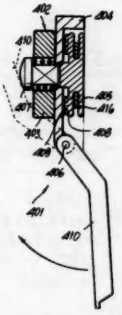
Division of Ser. No. 378,341, Jul. 10, 1989, Pat. No. 5,048,204.

This application Jul. 1, 1991, Ser. No. 724,031

Claims priority, application Italy, Jul. 22, 1988, 82572 A/88; Jan. 20, 1989, 82503 A/89

Int. Cl.[5] A43C *11/00*

U.S. Cl. 36—50.5 **12 Claims**



1. Securing device particularly for a ski boot comprising:

a circular winding device for winding a first traction element which is connected thereto; and

a pivoting lever for tensioning a second traction element which is connected thereto;

said circular winding device comprising a rotatable cable pulley element and a knob element which is manually actuatable to rotate said cable pulley element in a winding direction of said first traction element, the securing device further comprising:

means for blocking said cable pulley element from rotating in an unwinding direction of said first traction element;

said means for blocking being releasable to allow said cable pulley element to rotate in an unwinding direction of said first traction element, said pivoting lever being positionable in a first position for tensioning said second traction element and in a second position for releasing tension of said second traction element, wherein a pivoting movement of said lever from said first position to said second position releases said means for blocking said cable pulley element which is thus enabled to rotate in the unwinding direction of said first traction element.

5,150,538

SUBMERGING FISHING LURE

William R. Buchanan, Long Beach, Calif., assignor to Sevenstrand Tackle Corporation, Long Beach, Calif.

Filed Feb. 25, 1991, Ser. No. 660,128

Int. Cl.[5] A01K *85/00*

U.S. Cl. 43—42.28 **13 Claims**

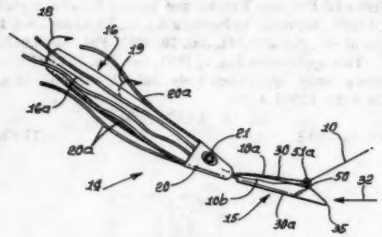
1. In a fishing lure, the combination comprising

a) a lure head and a lure tail spaced apart longitudinally, the tail being longitudinally elongated and including plastic strands,

b) the head having a front edge, and two laterally spaced, elongated edges tapering rearwardly and toward the tail, the head having opposed faces with spacing therebetween substantially less than the length dimension of each of said elongated edges, the head having weight substantially greater than the weight of said lure tail, one of said opposed faces being generally dome shaped and having a

crest and two forward bevels, the other of said opposed faces being substantially flat,

c) and there being means to connect a fishing line to the dome shaped face at said crest,



d) the tail having a substantially stiff portion extending rearwardly from a rotary connection to the head,

e) said bevels terminating rearwardly along two rearwardly convex lines that extend at opposite sides of said crest, said bevels also intersecting said substantially flat face.

5,150,539

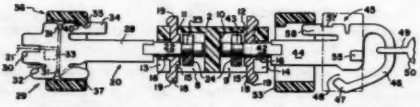
SWIVEL CONSTRUCTION

Bret S. Sorola, 882 N. Salem #3, Essexville, Mich. 48732

Filed Feb. 28, 1991, Ser. No. 662,416

Int. Cl.[5] A01K *91/00*

U.S. Cl. 43—43.1 **19 Claims**



1. A swivel construction for attaching a fishing tackle element to a fishing line, said construction comprising a body; a connector having one end thereof rotatably coupled to said body and its opposite end extending beyond one end of said body; anchor means carried by said opposite end of said connector and on which one end of a fishing line may be wound; releasable clasp means carried by said connector for movement into and out of a position in which a fishing line wound on said anchor means is trapped thereon; and coupling means carried by said body at its opposite end for removably coupling a fishing tackle element to said body.

5,150,540

SINKER SLIDER

Robert A. Bennett, Easton, Conn., assignor to Charlotte Ambrogio, Stratford and Sally Conant, Orange, both of, Conn., a part interest

Filed Mar. 9, 1992, Ser. No. 848,043

Int. Cl.[5] A01K *91/02*

U.S. Cl. 43—43.12 **5 Claims**

1. An integral plastic sinker slider structure comprising:

a first hollow cylinder open at both ends;

a second hollow cylinder open at both ends and parallel to the first cylinder, the two cylinders being disposed side by side and secured together, the second cylinder being disposed below the first cylinder, the second cylinder having an outer wall with a plurality of equidistantly spaced elongated slots that extend in parallel from one end of the second cylinder to a point intermediate the ends of the second cylinder and form a flexible region with the said one end, the region having an first internal longitudinal bore with a first cross sectional area, the remainder of the second cylinder having a second internal longitudinal bore which is a continuation of the first bore with a second and larger cross sectional area;

an elongated member secured at one end to the outer wall of the second cylinder and having a third cross sectional area intermediate its ends which is smaller than the first area; and

means secured to the other end of the member and adapted

be engagable with manual pressure into said one end of the second cylinder and held locked therein by the flexure of said region, the means having at least one fourth cross sectional area larger than the first area and smaller than the second area, the locked means being unlocked with the means being released from the second cylinder when a sufficient force is exerted on the means in a direction away from the cylinders.

5,150,541

DEVICE FOR KILLING INSECTS

James P. Foster, Chadds Ford, Pa., and Philip V. Jennings, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 340,287, Apr. 19, 1989, abandoned. This application Oct. 15, 1990, Ser. No. 597,404

Int. Cl.[5] A01M *1/20*

U.S. Cl. 43—131 **12 Claims**

1. A device for killing insects, which device is in the shape of a solid cylinder, intersecting rectangles, or intersecting triangles whose surface comprises:

(i) a toxin-containing element which is visible and available to target insects except for about 22% to 50% of its surface which is covered by

(ii) a mesh that protects nontarget organisms from contact with the toxin; the toxin being

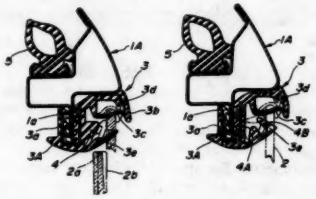
(iii) tetrahydro-2-(nitromethylene)-2H-1,3-thiazine or its N-formyl derivative; wherein the device operates dry.

5,150,542

GLASS RUNNER STRUCTURE OF VEHICULAR DOOR

Shuichi Hannya, Chigasaki, and Nozomi Iida, Hadano, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jan. 17, 1989, Ser. No. 297,739
Claims priority, application Japan, Jan. 22, 1988, 63-11984
The portion of the term of this patent subsequent to Aug. 27, 2008, has been disclaimed.
Int. Cl.[5] E06B 7/16
U.S. Cl. 49—441 **11 Claims**



1. In a glass runner structure installed in a window frame of a door for guiding upward and downward movement of a window panel,

an elongate base portion secured to and extending along said window frame;

an elongate main seal portion integral with said elongate base portion, said elongate main seal portion being so arranged that when said window panel assumes a fully closed position, an upper edge of said window panel abuts sealingly against said elongate main seal portion;

an elongate seal lip integral with said elongate base portion, said elongate seal lip contacting sealingly to an inner surface of said window panel when said window panel assumes said fully closed position; and

means for directing the upward movement of said window panel toward a desired portion of said elongate main seal portion when, upon contact of said seal lip with said inner surface of said window panel, said elongate seal lip is flexed by said window panel to such a degree as to contact with said elongate base portion.

5,150,543

DOOR

Klaus Wessiepe, Essen, and Wilhelm Stewen, Oberhausen, both of Fed. Rep. of Germany, assignors to Ruhrkohle AG, Essen, Fed. Rep. of Germany

Division of Ser. No. 508,493, Apr. 10, 1990, Pat. No. 4,986,032, which is a continuation of Ser. No. 285,837, Dec. 15, 1988, abandoned. This application Nov. 6, 1990, Ser. No. 609,721
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743692
The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.
Int. Cl.[5] E06B 7/16
U.S. Cl. 49—477 **24 Claims**

1. A door assembly for substantially closing a door opening, said door assembly comprising:

a sealing element for being disposed adjacent to an outer surface of the periphery of said door opening, and substantially closing said door opening; and

frame member means for being disposed about and adjacent to an outer surface of the periphery of said door opening;

said frame means comprising inflatable means and a plurality of force generating means for applying a purality of forces to said sealing element about the periphery of said door opening;

said inflatable means being disposed to extend said plurality of force generating means adjacent said sealing element at a plurality of points for pressing said sealing element against the periphery of said door opening;

wherein said sealing element comprises a light weight shield; and

wherein said light weight shield comprises sheet metal;

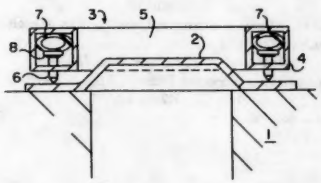
wherein said frame member means comprises a hollow profile frame having at least one end;

wherein said inflatable means is disposed within said hollow profile frame;

wherein said inflatable means comprises at least one inflatable hose;

wherein said plurality of force generating means comprise slidable tappets for sliding back and forth within said frame means;

wherein said slidable tappets comprise elongated cylindrical



elements disposed in holes in said frame member means which comprise a hollow profile frame;

wherein said tappets include head means for being in contact with said at least one inflatable hose;

wherein said at least one inflatable hose applies substantially equal force to all said slidable tappets;

wherein said at least one inflatable hose is configured to receive a coolant therein;

wherein said at least one inflatable hose is positioned at the end of said frame that is farthest away from said door opening; and

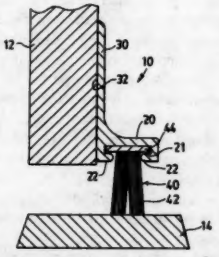
wherein said tappets are interposed between said at least one inflatable hose and said sealing element to maintain a sufficient separation between said at least one inflatable hose and said door opening to minimize heat transfer from said door opening to said at least one inflatable hose.

5,150,544

MAGNETICALLY MOUNTED DOOR SWEEP

Viola C. Burnett, Farmington, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Aug. 28, 1991, Ser. No. 750,989
Int. Cl.[5] E06B 7/16
U.S. Cl. 49—493 **7 Claims**



1. A door sweep for engaging a metallic door to position a non-magnetic seal relative to a threshold and the door, the non-magnetic seal having a sealing portion and a backing portion, the door sweep comprising:

(a) retaining means for cooperatively engaging the backing

portion of the seal to secure the seal relative to the door sweep; and

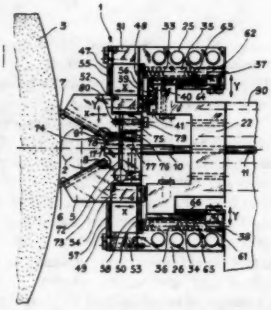
(b) integral magnetic fastening means for releasably magnetically securing the door sweep to the metallic door with sufficient attractive force to dispose the sealing portion of the seal in a non-magnetic adhesive free substantially sealing relation with the threshold.

5,150,545

ARRANGEMENT FOR MEASURING THE DIAMETER OF CYLINDRICAL PARTS DURING THE MACHINING THEREOF

Xavier Estéve, Marin, Switzerland, assignor to Meseltron S.A., Corcelles, Switzerland

Filed Aug. 1, 1991, Ser. No. 738,862
Claims priority, application France, Aug. 2, 1990, 90 10018
Int. Cl.[5] B24B *49/04*
U.S. Cl. 51—165.74 **9 Claims**



1. A measuring arrangement, in particular in a machine tool, for interrupting the machining operation on a cylindrical part when such part has attained a predetermined diameter, such arrangement including:

a head exhibiting an opening provided with two rectilinear ridges positioned in the form of a V and adapted to bear against the part to be machined, said head showing two parallel faces substantially perpendicular to the axis of the part to be machined, said parallel faces defining the thickness of the head,

a sensor mounted on such head and arranged along the bisector of the angle formed by the two ridges, said sensor furnishing a signal representative of the diameter of the cylindrical part, the head being oriented relative to the part to be machined in a manner such that said bisector is situated in a plane substantially parallel to the horizontal,

means coupling the head to a base fixed to the machine frame in order to assure contact of said ridges with the cylindrical part during the machining operation, said coupling means being arranged so as to assure the mobility and the retention of the head in a plane X-Y substantially perpendicular to the axis of the cylindrical part to be machined,

elastic urging means urging the head against the part to be machined, and

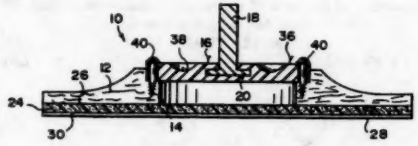
elastic sustaining means for sustaining the head with its coupling means on the base fixed to said machine frame, said sensor, said coupling means, said elastic urging means, and said elastic sustaining means all being located within a space bounded by the extension of said two parallel faces defining the thickness of the head.

5,150,546

DISC SANDER IMPLEMENT

Clifton E. Tucker, 11000 Tom Weiskopf, El Paso, Tex. 79936

Filed Dec. 2, 1991, Ser. No. 801,427
Int. Cl.[5] B24B *23/02*
U.S. Cl. 51—170 T **5 Claims**



1. A disc sander implement which comprises:

a) a circular rigid pad fabricated out of a durable material having a rigid circumferential periphery extending around a circumferential periphery of the implement and having a large central aperture therethrough;

b) an elastometric disc shaped flexible connector having an annular concave recess formed at a central location in a top surface thereof, to permit the elastometric connector to flex on said rigid pad in said large central aperture and the elastometric connector being secured only at a circumferential periphery secured to said rigid pad in said large central aperture;

c) a spindle having an enlarged head embedded into the elastometric connector at a location concentric with the annular recess for detachably connecting said rigid pad to a driving unit and for rotation relative to a portion of the driving unit, so that said large central aperture in said rigid pad will give clearance for bending and flexing of said elastometric connector when rotating;

d) a cushion member of sponge rubber attached to said rigid pad by a permanent adhesive; and

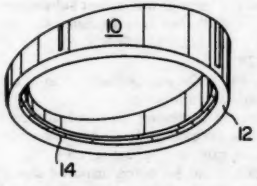
e) an abrasive sheet removably affixed to a front side of said cushion member by adhesive, said elastometric connector being the sole means of connecting the spindle to the rigid pad so that the flexure of the elastometric connector permits said abrasive sheet always to remain in a flat contact with a work surface with a slight pressure and little effort when a user of the driving unit moves said sander in a pendulum motion across the work surface.

5,150,547

OPHTHALMIC LENS PRISM BLOCKING RING

David O. Johnson, 2104 Shenandoah Rd., Raleigh, N.C. 27603

Filed May 6, 1991, Ser. No. 695,929
Int. Cl.[5] B24B *41/06*
U.S. Cl. 51—216 LP **2 Claims**



1. An ophthalmic lens prism blocking ring for holding a lens during grinding to introduce a prism correction therein and comprising:

a substantially circular annulus adapted to be detachably connected between an ophthalmic lens to be ground and a blocking body, said annulus having a flat lower annular

surface and having a first thickness at the first end of a diameter and a second thickness at the opposite end of said diameter and defining an inclined plane therebetween, said incline defining the amount of prism that will be introduced into the lens upon the completion of grinding and further including means for detachably connecting said ophthalmic lens prism blocking ring to the blocking body comprising an annular recessed slot in the lower surface of said ophthalmic prism blocking ring, said slot adapted to frictionally engage and contact the blocking body along its entire perimeter, said slot being the sole means by which said ophthalmic lens prism blocking ring and the blocking body are connected.

5,150,548

METHOD FOR TREATING THE SURFACE OF AN ARTICLE WITH SOLID PARTICLES

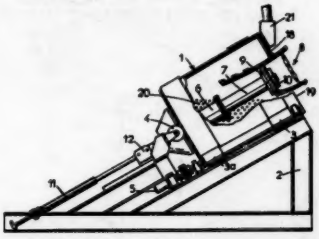
Jean P. M. Boquet, Le Perray en Yvelines; Daniel J. A. Ermisse, Pecqueuse, and Gabriel J. L. Cattin, Pont de Roide, all of France, assignors to Bertin & Cie, Plaisir Cedex and Cattin-'Air SA, Pont de Roide, both of, France

Division of Ser. No. 912,108, Sep. 29, 1986, Pat. No. 5,027,558. This application Jul. 2, 1991, Ser. No. 724,853

Claims priority, application France, Sep. 27, 1985, 85 14335

Int. Cl.[5] B24B *1/00, 9/00, 31/00*

U.S. Cl. 51—313 **3 Claims**



1. A method for treating a surface of an article by contacting said surface with solid particles, comprising the steps of:

providing a vessel having an axis of symmetry oblique in relation to the horizontal around which it can rotate, said vessel having walls and an upper axial end with an opening of sufficient size to permit the passage of an article to be treated,

filling said vessel with solid particles substantially to a level such that when said vessel is in said oblique position, said particles are retained in said vessel by the walls of the vessel,

driving said vessel in rotation on the axis at a speed so that the solid particles are caused to be driven by the walls of the vessel and fall as a shower inside the vessel,

moving said article from a load/unload position, where the article is outside the solid particles, to a working position inside the vessel, said movement being done while the vessel rotates and while the particles fall as a shower onto said article, the article being moved obliquely in relation to the horizontal and parallel to the axis of the vessel,

maintaining the article substantially fixed in said working position during treatment, and

moving back said article to said load/unload position after treatment.

5,150,549

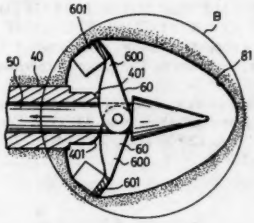
ANCHOR PILE AND CONCRETE PROTECTION WALL CONSTRUCTION USING SAID ANCHOR PILE

Chin-Lung Chen, No. 55-2, Pen-Chou Rd., Kang-Shan Chen, Kaohsiung Hsien, Taiwan

Filed Jan. 3, 1992, Ser. No. 816,261

Int. Cl.[5] E02D *5/74*

U.S. Cl. 52—162 **10 Claims**



1. An anchor pile for reinforcing a concrete protection wall on a mountainside, comprising:

an elongated tubular member having a rear end and a front end, with an annular recess formed therein;

a shaft slidably extending into said tubular member and having a first end portion which extends out of said rear end of said tubular member and a second end portion which extends out of said front end of said tubular, member and which is provided with an enlarged head; and

a foldable anchor means having at least one anchor arm, which is pivoted to said second end portion of said shaft inward of said enlarged head and which extends radially outward when in use, and a curved anchor flange integrally connected to said anchor arm, said anchor flange being extended over said front end of said tubular member and being received in said annular recess when said anchor is folded.

5,150,550

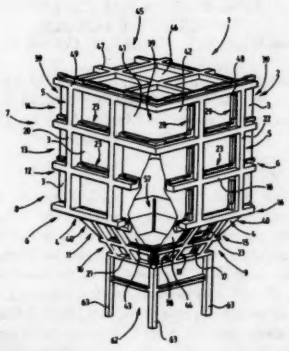
SILO MADE OF SUSPENDED SHEETS

Guy Rionde, La Samaritaine, 88800 Vittel, France

Filed Feb. 11, 1991, Ser. No. 653,376

Int. Cl.[5] E04H *7/00*

U.S. Cl. 52—192 **11 Claims**



1. A silo, comprising:

a framework comprising a plurality of vertically spaced horizontal support members, and a plurality of horizontally spaced vertical support members connected to said horizontal support members so as to define with said

horizontal support members a lattice-type framework comprising windows having perimeter portions defined by said horizontal and vertical support members; and

a plurality of plates suspendingly supported directly from said horizontal support members so as to cove said windows and fixedly connected to each other so as to define a closed interior surface for said silo.

5,150,551

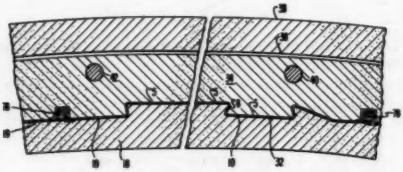
PRESTRESSED COMPOSITE CONCRETE TANK WITH IMPROVED PUMP JOINT AND METHOD FOR CONSTRUCTING THE SAME

Theodore R. Crom, Hawthorne, and Gerald C. Bevis, Archer, both of Fla., assignors to The Crom Corporation, Gainesville, Fla.

Continuation-in-part of Ser. No. 558,866, Jun. 30, 1990, abandoned. This application Mar. 12, 1991, Ser. No. 669,063

Int. Cl.[5] E04D *1/00*; E04C *3/10*

U.S. Cl. 52—223 R **23 Claims**



1. In a prestressed composite tank, a vertical wall extending around a storage area, said wall comprising a substantially vertical diaphragm, said diaphragm being formed of a plurality of side-by-side vertical panels, said panels each having a vertically extending edge portion on each side thereof, the adjacent vertical edge portions of each side-by-side panels being interlocked to assist in holding the panels together during construction and being configured to present an initially hollow channel extending the entire vertical extent of the interlocked edge portions, said hollow channels being completely enclosed and surrounded by said edge portions to thereby resist damage and exclude contamination, said wall further including an initially fluid sealant material filling each of said channels, said sealant material having hardened in said channels to thereby present fluid impervious joints between the panels.

5,150,552

BUILDING SYSTEM FOR EXTENSION OF PROGRESSIVE HOUSING

Craig Davis-Arzac, Pino Number 30, Colonia Florida, 01030, Mexico

Continuation of Ser. No. 431,111, Nov. 3, 1989. This application Feb. 26, 1992, Ser. No. 839,292

Claims priority, application Mexico, May 19, 1989, 16107

Int. Cl.[5] E04B *1/00*

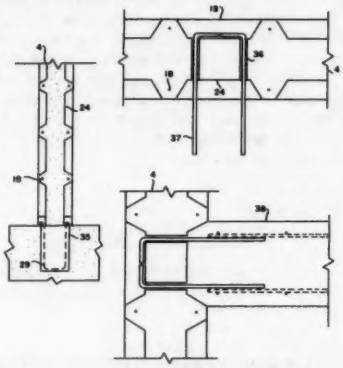
U.S. Cl. 52—259 **6 Claims**

1. A building structure comprising:

a plurality of vertical wall reinforcements comprised of elongate precast concrete members of rectangular form having internal longitudinal and transverse reinforcing bars and four planar outer surfaces, said longitudinal and transverse reinforcing bars being disposed with adjacent ones of said longitudinal reinforcing bars and adjacent ones of said transverse reinforcing bars defining rectangular patterns inward of said outer surfaces, and a plurality of indentations cast in said outer surfaces, each indentation being of substantial depth and positioned to overlay one of said rectangular patterns,

brickwork joined to said vertical wall reinforcements, said brickwork being laid adjacent one of said outer surfaces of said precast concrete members and keyed to said precast concrete member by mortar in said indentations, and

a plurality of steel reinforcements with a portion of each



steel reinforcement embedded between two successive courses of brick and an end of each steel reinforcement embedded in mortar in an indentation of the precast concrete member facing said consecutive brick courses.

5,150,553

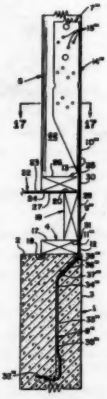
HOLDOWN STRAP

Alfred D. Commins, Danville, and Ernest A. Romeo, Healdsburg, both of Calif., assignors to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed Aug. 9, 1990, Ser. No. 564,869

Int. Cl.[5] E02D *27/02*; E04B *1/38*

U.S. Cl. 52—264 **10 Claims**



1. A holdown strap connection comprising:

a. a concrete foundation having an upper surface and a side surface;

b. a generally horizontally extending wood mudsill having an outside edge and an upper side and a lower side resting on said concrete foundation;

c. a rim joist member having an upper edge, a side, and a lower edge resting on said upper side of said wood mudsill;

d. a subfloor member having an upper face, an edge, and a lower face resting on said upper edge of said rim joist member;

e. a wood sole plate having an upper side, an edge and a lower side resting on said upper face of said subfloor member;

f. a generally vertical wood frame member having an outside edge and a side face and mounted on said wood upper side of said wood sole plate;

g. an elongated sheet metal holdown strap connector comprising:

1. a foot section embedded in said concrete foundation,

2. a transition section having an upper portion and a lower portion connected to said foot section and extending from said concrete foundation past said outside edge of said wood mudsill, along said side of said rim joist, along said edge of said subfloor; along said edge of said sole plate and along a portion of said edge of said vertical wood frame member, and

3. an elongated strap section connected to said upper portion of said transition section and extending and in registration with said side face of said vertical wood frame member and formed with a plurality of fastener openings therethrough; and

h. fastener means dimensioned for insertion through said fastener openings in said elongated strap section of said elongated sheet metal holdown strap connector and into said vertical wood frame member.

5,150,554

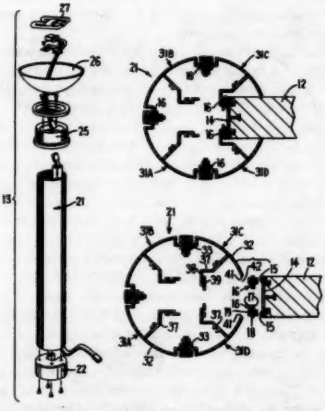
PANEL-POST ARRANGEMENT

Roger J. Quinlan, Jr., and Stephen J. Simpson, both of Holland, Mich., assignors to Haworth, Inc., Holland, Mich.

Filed Dec. 19, 1990, Ser. No. 630,036

Int. Cl.[5] E04B *1/00*; E04F *17/08*

U.S. Cl. 52—282 **14 Claims**



1. In an upright space divider system including a plurality of horizontally interconnected upright space divider panels, said system also including a post assembly joined to and projecting upwardly along one vertical end edge of at least one said panel, the improvement wherein said post assembly includes:

a hollow upright post extending upwardly along said one end edge of said one panel throughout substantially the full vertical height thereof, said post having a generally tubular outer wall having a cross section which is substantially greater than the width of said one panel;

said post being defined by a plurality of separate vertically elongate post segments which circumferentially cooperate to define the cross section of the post, each said post segment having a peripheral wall segment which defines only part of the outer wall of said post;

securing means including a vertically elongate securing element which is separate from said post segments for joining circumferentially adjacent pairs of post segments together;

each said post segment having a securing flange fixed to the respective peripheral wall segment and projecting inwardly into the interior of the post;

said post having a slotlike opening which opens inwardly thereof through said outer wall and extends vertically throughout substantially the full height thereof;

said one panel begin positioned so that said one end edge thereof projects horizontally through said slotlike opening into the interior of said post; and

connecting means disposed interiorly of said post for connecting the one end edge of said one panel to one of said securing flanges, said connecting means including a vertically elognate connecting element which is separate from said post segments and said panel.

5,150,555

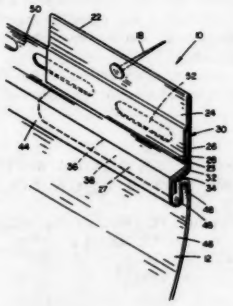
SIDING CLIP

Larry A. Wood, 9000 Kolbrook Rd., Denton, Nebr. 68339

Filed Jul. 12, 1991, Ser. No. 729,033

Int. Cl.[5] E04D *1/34*

U.S. Cl. 52—544 **9 Claims**



1. A siding clip, comprising:

a generally vertically planar sheet of rigid material folded upon itself to form a generally horizontal upper folded edge with depending forward and rearward legs having lower free ends and upper ends connected together to form said upper folded edge;

said forward leg extending downwardly parallel and adjacent to the rearward leg;

said forward leg being bent forwardly intermediate its upper and lower ends and thence downwardly parallel to the rearward leg, to form a downwardly opening vertical slot between said forward and reward legs;

said rearward leg being bent forwardly at a first horizontal bend below the lower end of said forward leg; and

the lower end of side rearward leg being bent downwardly at a second horizontal bend, so as to be oriented generally parallel to said forward leg.

5,150,556

CHORD TRUSS ROOF STRUCTURE

Toshiyuki Yamada; Yoshihiro Takahama; Kazushige Kurihara, and Hajime Nakajima, all of Tokyo, Japan, assignors to Shimizu Construction Co., Tokyo, Japan

Filed Sep. 25, 1990, Ser. No. 587,679

Claims priority, application Japan, Oct. 6, 1989, 1-261622; Oct. 6, 1989, 1-261623

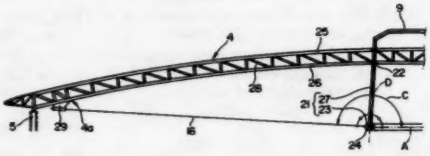
Int. Cl.[5] E04B *1/32, 7/08*; E04C *3/38*

U.S. Cl. 52—639 **4 Claims**

1. A chord truss roof structure for mounting on side wall sections comprising:

a ring-girder having a tension ring disposed approximately at the center of the chord truss roof, a compression ring located above the tension ring and in parallel thereto, and struts connected between the compression ring and the tension ring;

cross beams radially erected between the compression ring and said side wall sections, each cross beam having one side portion and another side portion, each one side portion being coupled to the compression ring and each other side portion being coupled to the side wall sections;



chord members, each having a first end and a second end, said chord members extending under tension, with said first ends being connected to said tension ring and said second end being connected to said another side portions, said first ends defining a plane through said tension ring;

connection members each connection member being connected between two end portions, said connection members being disposed in said plane, so that the chord members and the connection members therebetween form a unitary structure;

whereby the chord truss roof structure can be erected without a support base for supporting thereof.

5,150,557

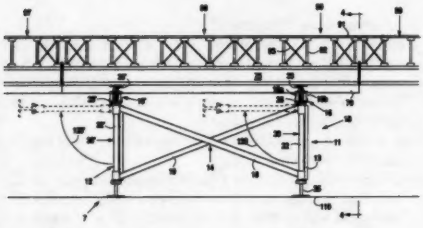
ADJUSTABLE SHORING SYSTEM

Robert K. Gregory, 1110 Eikel, Ste. C, New Braunfels, Tex. 78130

Filed Dec. 17, 1990, Ser. No. 629,116

Int. Cl.[5] E04H *12/00*

U.S. Cl. 52—646 **13 Claims**



1. An improved shoring leg, comprising:

a timber post having a longitudinally-oriented central hole there through, said post being cut to a desired length for its intended use, and said post having first and second opposing longitudinal ends;

a first end cap fit snugly on the first end of said post, said first end cap including an end plate having a central hole there through for receiving the shank of a screw jack, said central hole being oriented concentric with the pilot hole of said post to enable boring of a bore sized to receive;

a screw jack operably mounted to said post at said first end cap for enabling employment of the shoring leg in a shoring system, the shank of said screw jack fitting within a similarly-sized bore in the first end of said post which is bored with the guidance of said pilot hole;

said post comprises first and second mating members which are laminated together on mating faces, at least one of said mating members being provided with a groove along its length in a position such that, upon mating of said mating members, said groove defines the pilot hole through said post.

5,150,558

CLOSING MECHANISM FOR A CAPPING MACHINE

Herbert Bernhard, Wolfsheim, Fed. Rep. of Germany, assignor to SEITZ ENZINGER NOLL Maschinenbau Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

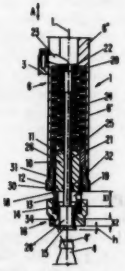
Filed Jul. 5, 1991, Ser. No. 726,387

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1990, 4021959; May 10, 1991, 4115285

The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.

Int. Cl.[5] B65B *7/28, 55/24*

U.S. Cl. 53—167 **26 Claims**



1. A closing mechanism, for a rotary-type capping machine, for capping bottles with crown caps, said closing mechanism being disposed over a bottle support and means for lowering said closing mechanism out of a starting position and raising again into said starting position by vertical movement, said closing mechanism comprising:

a deformation member for placing a crown cap on a mouth portion of a bottle and for subsequently fixing said crown cap on said mouth portion by permanent deformation;

a hold-down mechanism that extends centrally through said deformation member and cooperates with at least one spring, with said hold-down mechanism having a hold-down surface that faces said bottle support and is provided with a holding means for holding said crown cap;

a centering means for centering said crown cap before same is placed on said bottle, with said centering means being provided on a lower end of said closing mechanism, which end faces said bottle support, and with said centering means having a centering opening through which said hold-down mechanism also centrally extends, with said centering opening having at least a first centering portion that narrows upwardly in a frusto-conical manner and a second centering portion that adjoins said first centering portion on an upper side thereof, said second centering portion having a diameter greater than that of said crown cap prior to deformation thereof, whereby said bottle support is provided with means that permits a movement of said bottle in directions perpendicular to a vertical axis for alignment of said bottle relative to said centering means;

a first closing mechanism part that cooperates with said at least one spring by being displaceable against the action thereof, with said hold-down mechanism being displaceable on said first closing mechanism part and being centrally spaced from said lowering means to permit said hold-down mechanism an unrestricted upward free stroke into said space for centering said crown cap; and

means for making said at least one spring effective such that upon placement of said crown cap on said mouth portion of said bottle and upon further lowering of said closing mechanism, said at least one spring is effective via said hold-down mechanism upon said crown cap and via said

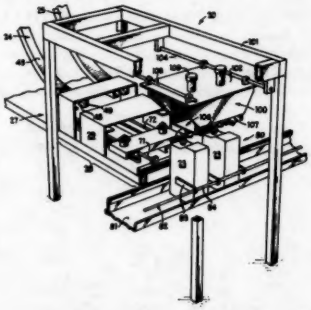
crown cap upon said mouth portion of said bottle only after said crown cap, which is already disposed on said mouth portion, is completely received by said second centering portion.

5,150,559

FLUID CONTAINER CAPPER APPARATUS

Edward O. Winfield, Kansasville, Wis., assignor to Plant Services Corp., Kenosha, Wis.

Filed Oct. 7, 1991, Ser. No. 772,474
Int. Cl.[5] B65B *7/28, 61/00, 1/00*
U.S. Cl. 53—306 **16 Claims**



1. An apparatus for mounting caps onto fluid containers in a particular predetermined orientation relative to said fluid containers, said caps each having a top portion, a bottom portion, with a substantially radially symmetrical seating portion and a substantially radially symmetrical central portion, intermediate said top and bottom portions, a radially outwardly extending element at a predetermined circumferential position on said central portion, said containers each having a neck portion and an opening arranged at an end of said neck portion, said apparatus for mounting caps onto fluid containers comprising;

a source of caps for said fluid containers;

means for transporting each of said caps in succession from said source to a cap drop position, said caps arriving at said cap drop position in random relative orientation between successive caps;

means for seating each of said caps after each of said caps has arrived at said cap drop position;

means for transferring said seating means from said cap drop position to a delivery position;

means for aligning said caps, one at a time, from said random relative orientation, into a predetermined seated alignment in said seating means, prior to arrival of said seating means at said delivery position, so as to orient said seating means and said caps, respectively, into a predetermined position for pick-up and securement of each of said caps onto said neck portion of a corresponding one of said fluid containers, said means for aligning said caps cooperating with said radially outwardly extending elements;

means for moving said fluid containers from a source of said fluid containers, successively, to a capping position; and

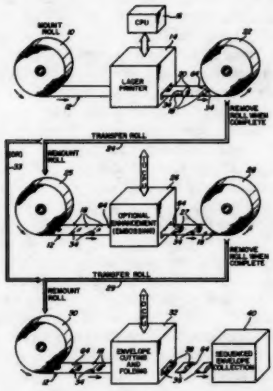
means for picking up said caps at said delivery position and positioning said caps onto said neck portions of said corresponding fluid containers at said capping position to substantially cover the openings of said corresponding fluid containers.

5,150,560

SYSTEM AND METHOD FOR MANUFACTURING ENVELOPES

H. W. Crowley, Newton, Mass., assignor to Roll Systems, Inc., Burlington, Mass.

Filed Jun. 12, 1991, Ser. No. 714,232
Int. Cl.[5] B65B *11/48, 61/02*
U.S. Cl. 53—411 **35 Claims**



1. A method for manufacturing printed envelopes comprising the steps of:

feeding web from a source roll into a variable information printer;

printing envelope information by means of a variable information printer on selected consecutive locations of the web;

outputting the web from the printer to an output roll;

re-orienting the output roll so that the web may be unrolled;

subsequent to outputting, cutting and folding individual envelopes from the output roll in response to detection of the locations; and

directing the envelopes to a collection point in a predetermined sequence, the envelope being formed into sequenced bundles of predetermined size, the bundles being contained by a containing means to enable transfer to a contents insertion location.

5,150,561

METHOD FOR MAKING SIDE OPENING FLEXIBLE BAG WITH LONGITUDINALLY ORIENTED CARRYING HANDLE SECURED TO SIDE PANELS

Delmar R. Muckenfuhs, Middletown, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 451,498, Dec. 15, 1989, Pat. No. 5,054,619.
This application Jun. 17, 1991, Ser. No. 716,441
Int. Cl.[5] B65B *43/04, 61/14, 61/18, 63/02*
U.S. Cl. 53—412 **7 Claims**

1. A method for making an easy open substantially rectangular bag of compressed flexible articles having a carrying handle extending in a direction substantially parallel to the direction of compression of said articles, said flexible articles being arranged in a stack and held in compression in a direction substantially parallel to their thickness, said method comprising the steps of:

(a) providing at least two discrete and separate portions of a final continuous line of weakness in a web of flexible material comprising said bag at predetermined locations, a section of each said portion being substantially perpendicular to the length of said web;

(b) forming a "W"-shaped cross-section in said web of flexible material comprising said bag so that said discrete

portions of said continuous line of weakness are located in the outermost legs of said "W" and so that said discrete portions of said continuous line of weakness substantially coincide with one another, wherein said substantially perpendicular sections extend toward the "W fold" of said web;

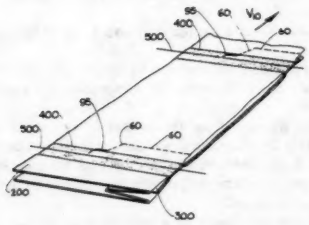
(c) feeding a web of the material comprising said handle parallel to the web of material comprising said bag;

(d) nesting said web of handle material within the "V"-shaped portion of said web of "W"-shaped flexible material comprising said bag;

(e) sealing said nested webs to one another at predetermined locations along their length to form said continuous line of weakness by sealing together ends of said discrete portions and a web of interconnected, unerected flexible bags, each having a carrying handle secured thereto;

(f) severing said discrete unerected flexible bags from said web in the sealed areas of said web;

(g) partially erecting each of said severed flexible bags to form a substantially rectangular cross-section comprising a front and a back panel connected to one another by means of a pair of opposed side panels, said partially erected flexible bag having a top panel secured about its periphery to said front, back and end panels and a carrying handle secured at its ends to the side panels of said partially erected flexible bag, said flexible bag having an easy open device comprising a substantially continuous line of weakness located at least partially within one of said side panels, said substantially continuous line of weakness defining a predetermined portion of said side panel to be at



least partially separated from the remainder of said side panel without impairing the functionality of said carrying handle, said partially erected flexible bag further having an open bottom end;

(h) forming a stack of flexible articles oriented so that the substantially planar surface of said articles is aligned substantially parallel to the side panels of said bag and the outermost peripheral edges of the articles contained in said stack are aligned substantially parallel to the front, back and top panels of said bag;

(i) compressing said stack of flexible articles between a pair of opposed knife belt assemblies in a direction substantially parallel to the thickness of said articles contained in said stack until said knife belt assemblies and said stack of compressed articles can pass through the open bottom end of said partially erected bag without causing interference between the outermost surfaces of said knife belt assemblies and the innermost surfaces of the adjacent side panels of said partially erected bag;

(j) moving said knife belt assemblies and said partially erected bags relative to one another so that said knife belt assemblies pass into the open bottom end of each of said partially erected flexible bags;

(k) simultaneously driving the opposed knife belts associated with said knife belt assemblies in a direction which advances said stack of compressed articles into contact with the innermost surface of said top panel of said partially erected flexible bag;

(l) moving said knife belt assemblies and said partially erected flexible bags relative to one another at a first velocity V_1 so that said knife belt assemblies are completely retracted from the open end of each of said partially erected flexible bags while simultaneously driving the knife belts associated with said knife belt assemblies at a second velocity V_2 which is equal to or greater than said first velocity V_1 to maintain said stack of compressed articles in intimate contact with the innermost surface of said top panel of each of said partially erected flexible bags as said stack is released from said knife belts and said knife belt assemblies pass through the open bottom end of each of flexible bags;

(m) folding said open bottom end of each of said partially erected, filled flexible bags to form a closed bottom panel adjacent said stack of compressed flexible articles; and

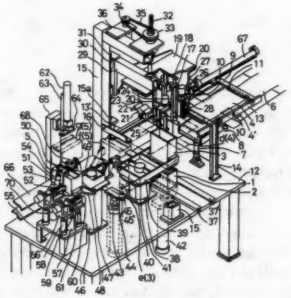
(n) securing said bottom panel in a closed position to complete said bag.

5,150,562

METHOD AND APPARATUS FOR PACKAGING RESILIENTLY DEFORMABLE ARTICLES

Yozo Araki; Isamu Ito, both of Nagoya; Tohru Sugimura, Kawanoe; Migaku Suzuki, Kawanoe, and Mitsuzo Ochi, Kawanoe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Uni-Charm Corporation, Ehime, both of, Japan

Filed Jun. 28, 1991, Ser. No. 722,499
Claims priority, application Japan, Jul. 2, 1990, 2-172663
Int. Cl.[5] B65B *13/20*
U.S. Cl. 53—438 **8 Claims**



1. A method for packaging resiliently deformable articles comprising the steps of:

providing an inner cassette having an open top and bottom and pairs of opposite end and side surfaces extending therebetween;

inserting a stack of resiliently deformable articles into the inner cassette;

placing a rectangular sheet of film having rectangular cardboard flaps affixed thereto along respective middle portions of opposite sides thereof on the open top of the inner cassette; folding said sheet of film, bringing said cardboard flaps into covering engagement with opposite end surfaces of the inner cassette and bringing flaps defined by portions of said sheet of film into covering engagement with opposite side surfaces of the inner cassette and then sealing margins projecting outwardly from the respective side surfaces of the inner cassette onto said cardboard flaps;

providing an outer cassette;

aligning the inner and outer cassettes;

thrusting the stack of the resiliently deformable products together with the film sheet and the cardboard flaps extending over the inner cassette upwardly through the open top out from said inner cassette into the outer cassette; and,

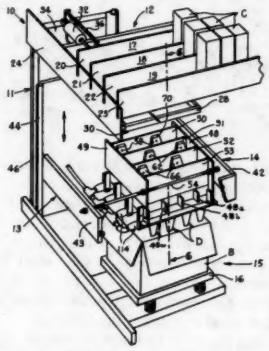
folding, overlapping and sealing lower ends of the respective film flaps.

5,150,563

SQUARE AND/OR ROUND CONTAINER PACKING DEVICE

Robert G. Hartness, Greer, S.C., assignor to Hartness International, Inc., Greenville, S.C.

Filed Sep. 25, 1991, Ser. No. 765,430
Int. Cl.[5] B65B *35/30*
U.S. Cl. 53—539 **8 Claims**



6. A guiding grid for an article loading machine for guiding articles having a substantially rectangular shaped cross-section dropped from a charge loading grid into a carton having sockets provided therein, said guiding grid comprising:

a plurality of parallel spaced grid plates,

a plurality of parallel spaced divider plates positioned transverse to and below said grid plates so that said grid plates and said divider plates define rectangularly shaped openings of a cross-section slightly greater than the cross-section of said articles;

a plurality of spaced guide blocks affixed to said grid plates in a staggered oppositely facing manner with one said guide block being positioned above each said opening defined by said grid plates and said divider plates; and

inclined surfaces provided on the top and sides of said guide blocks for contacting and directing said articles to a predetermined position in each of said openings as said articles are dropped through said openings, said inclined surfaces preventing said articles from contacting said divider plates.

5,150,564

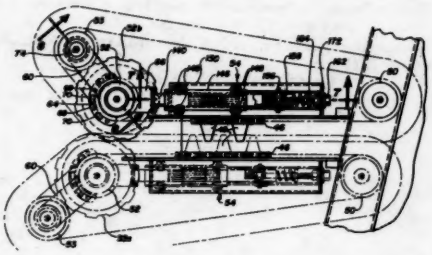
APPARATUS FOR CONVERTING GATHERING CHAIN PROFILES IN FORAGE HARVESTER ROW CROP ATTACHMENTS

Gary L. Bich, and Larry D. Hall, both of New Holland, Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Mar. 6, 1991, Ser. No. 665,050
Int. Cl.[5] A01D *45/02*
U.S. Cl. 56—98 **9 Claims**

1. In a row crop attachment for forage harvesters including a base frame, a plurality of row crop divider units arranged side-by-side on said base frame to define a plurality of crop conveying paths, a pair of gathering chains arranged to pass through each of said crop conveying paths from an entrance to an exit thereof for conveying crop material rearwardly through said crop conveying paths, a pair of rotary knives disposed adjacent the entrance of each of said crop conveying paths, an improvement comprising:

apparatus for converting each of said gathering chains between an extended profile where it is wrapped around a drive sprocket and a pair of idler sprockets with one of the idler sprockets being located forwardly of the rotary knives and a non-extended profile where it is wrapped



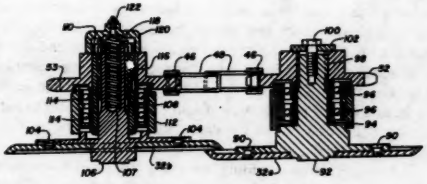
around said drive sprocket and the other idler sprocket so that said forwardly located idler sprocket and said converting apparatus are eliminated.

5,150,565

KNIFE MOUNTING ARRANGEMENT FOR FORAGE HARVESTER ROW CROP ATTACHMENTS

Gary L. Bich, New Holland, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Mar. 6, 1991, Ser. No. 665,046
Int. Cl.[5] A01D *45/02*
U.S. Cl. 56—102 **4 Claims**



1. In a row crop attachment for forage harvesters including a base frame, a plurality of row crop divided units arranged side-by-side on said base frame to define a plurality of crop conveying paths through which gathering chains pass for conveying crop material through said crop conveying paths, a pair of rotary knives with cooperating cutting edges disposed on opposite sides and adjacent an entrance of each of said crop conveying paths for cutting off crop material before it is conveyed through said crop conveying paths by said gathering chains, a mounting arrangement for each pair of rotary knives comprising:

one knife of each pair of rotary knives fastened to a hub shaft which has a splined portion cooperating with a mating splined portion of a sleeve that is rotatably supported on said base frame;

said splined portion of said hub shaft being longer than said splined portion of said sleeve to permit limited upward and downward movement of said hub shaft and said one knife relative to said sleeve; and

a spring urging said hub shaft in a direction to urge the cutting edge of said one knife into contact with the cutting edge of the other knife of each pair of rotary knives.

5,150,566

THREAD PROCESSING MACHINE SPINDLE ASSEMBLY HAVING MECHANICAL ADJUSTMENT MECHANISMS FOR DEVICES WITHIN A ROTATING THREAD BALLOON

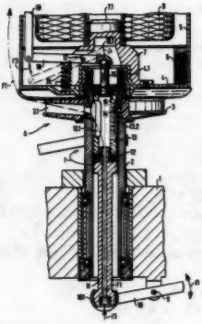
Heinz Stenmans, Grefrath, Fed. Rep. of Germany, assignor to Palitex Project Company GmbH, Fed. Rep. of Germany

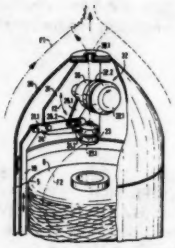
Filed Mar. 25, 1991, Ser. No. 674,676

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1990, 4010017

Int. Cl.[5] D01H *7/90, 1/10, 7/44*

U.S. Cl. 57—58.83 **18 Claims**





1. In a spindle assembly of a thread processing machine, of the type comprising a cabling or double twisting machine, wherein said spindle assembly includes top and bottom portions, a driven rotor mechanism having an axially-extending hollow shaft defining a thread passageway, a thread storage disk mounted for rotation with the rotor mechanism and having a radially-extending thread passageway communicating with said thread passageway of said rotor mechanism to define a first deflection means for changing the direction of thread travel from axial to radial during thread processing, a pot mechanism axially-extending upwardly from said rotor mechanism and around which a balloon of thread rotates during thread processing, axially-extending thread guide means positioned above said pot mechanism for receiving thread being processed and defining a second deflection means for changing the direction of thread travel from generally radial to axial during thread processing, and adjustable means for influencing the mode of operation of said spindle assembly and mounted thereon within the rotating thread balloon formed during thread processing; the improvement of:

movable mechanical linkage, extending from outside the rotating thread balloon to within such rotating thread balloon and to said spindle assembly operation influencing means, operating said spindle assembly operating influencing means and including hollow sleeve having an outside surface and upper and lower ends and mounted for axial movement in the vicinity of at least one of said thread deflection means and coaxial with said hollow shaft and having at least one lateral aperture for receiving thread to pass axially through said sleeve and radially out of said aperture at said one deflection means and for axial movement with said linkage during movement thereof for adjustment of said spindle assembly operation influencing means.

5,150,567

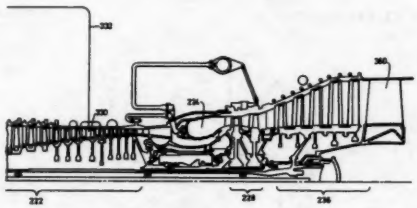
GAS TURBINE POWERPLANT

William M. Farrell, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 361,070, Jun. 5, 1989. This application Dec. 3, 1990, Ser. No. 620,956

Int. Cl.[5] F02G *3/00*

U.S. Cl. 60—39.02 **7 Claims**



1. A method of converting an aircraft turbofan engine to a non-aeronautical application, said aircraft engine having a fan, a first compressor downstream of said fan, a second compressor downstream of said first compressor, a combustor downstream of said combustor, a first turbine which is coupled to said second compressor through a first shaft and a second turbine downstream of said first turbine which is coupled to said first compressor and said fan through a second shaft, wherein said method comprises the steps of:

removing said fan from said second shaft;

attaching a means for coupling a load to the second shaft; and

attaching a means for balancing the forces on said second shaft to compensate for the removal of said fan.

5,150,568

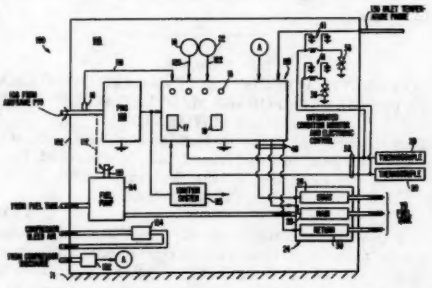
CONTROL AND PROTECTION SYSTEM FOR TURBINE ENGINES CONTAINED WITHIN A PROTECTIVE HOUSING

Robert C. White, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 769,471, Oct. 1, 1991, abandoned, which is a continuation of Ser. No. 497,714, Mar. 23, 1990, abandoned. This application Feb. 14, 1992, Ser. No. 834,986

Int. Cl.[5] F02C *7/32*

U.S. Cl. 60—39.31 **25 Claims**



1. A control for a power unit of an airframe including a prime mover providing non-propulsive output power to the airframe comprising:

a housing mounted on an exterior surface of the prime mover;

a power takeoff providing rotary power from the prime mover into the housing;

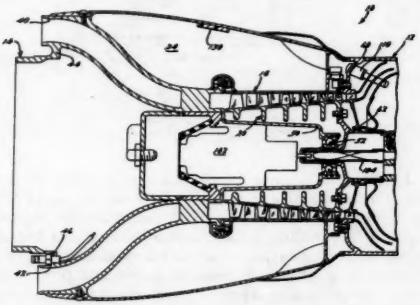
an electrical power generator contained within the housing which is driven by the power takeoff for providing electrical power within the housing;
at least one sensor mounted within the housing for sensing an operational parameter of the prime mover;
at least one electrical communication line between the at least one sensor within the housing and the controller with the at least one electrical communication line being electrically isolated from a filter, a voltage protection device and an overcurrent protection device and
a controller contained within the housing for controlling operation of the prime mover in response to signals coupled to the control from the at least one sensor mounted within the housing.

5,150,569

INTEGRATED PROPULSION SYSTEM

William I. Chapman, Birmingham, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Dec. 14, 1990, Ser. No. 628,108
Int. Cl.[5] F02C *7/26*
U.S. Cl. 60—39.142 **4 Claims**



1. An integrated propulsion system comprising:
an air intake;
a compressor stator supported by said air intake;
a front turbine shaft bearing supported by said air intake;
a compressor rotor on the front end of said turbine shaft;
an annular combustion chamber communicating with the outlet end of said stator; said turbine shaft being disposed internally of said combustion chamber;
a fuel passage having a fuel discharge nozzle therein disposed internally of said turbine shaft and rotatable therewith;
a turbine rotor on said turbine shaft;
a rear housing supported by said combustion chamber and having a turbine exhaust duct and rear bearing for the turbine shaft; and
an annular fuel tank coaxially related and radially aligned with said compressor stator.

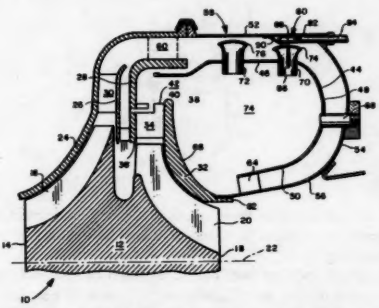
5,150,570

UNITIZED FUEL MANIFOLD AND INJECTOR FOR A TURBINE ENGINE

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 21, 1989, Ser. No. 455,563
Int. Cl.[5] F02C *7/22*; F23R *3/32*
U.S. Cl. 60—39.36 **11 Claims**

1. A gas turbine comprising:
a rotary compressor;
a rotatable turbine wheel coupled to said compressor to drive the same;
an annular nozzle for directing gases of combustion at said turbine wheel;
an annular combustor having an outlet connected to said nozzle;
a case in spaced relation to said combustor to define a plenum connected to said compressor;
angularly spaced inlet tubes oriented generally tangentially to the interior of the combustor and extending into the same from said plenum to create circumferential gas flow within said combustor;



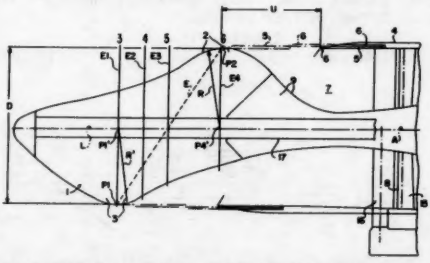
a flattened tube of generally annular configuration within said plenum and adapted to be connected to a source of fuel under pressure; and
apertures in said flattened tube at angularly spaced location corresponding to at least some of said inlet tubes and each aligned with a corresponding inlet tube.

5,150,571

DEVICE FOR EXPOSING OR SHUTTING OFF A TURBO-ENGINE ON THE INTAKE AIR SIDE OF THE ENGINE

Claus Herzog, Munich, Fed. Rep. of Germany, assignor to MTU Motoren- Und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

Filed Dec. 21, 1990, Ser. No. 631,886
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1989, 3942323
Int. Cl.[5] F02K *1/08, 1/04*; F02C *7/00*
U.S. Cl. 60—200.1 **20 Claims**



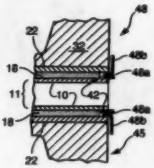
1. A device for exposing and shutting off a turbojet engine on an air intake side of the turbojet engine, comprising:
an engine shroud having a face end forming a casing lip;
a stationary centerbody arranged in front of said turbojet engine and including at least two vaulted areas axially and circumferentially displaced approximately 180° with respect to one another along a largest relative diameter, said stationary centerbody enclosing an axially spaced circumferential opening between said at least two vaulted areas and said casing lip; and
an annular slide valve which selectively extends from said engine shroud to expose or shut off the axially spaced circumferential opening.

5,150,572

INSULATED EXHAUST PORT LINER

Kenneth L. Johnson, Cincinnatti, Ohio, and William A. Updike, St. Louis, Mo., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Feb. 21, 1991, Ser. No. 659,037
Int. Cl.[5] F01N 07/14
U.S. Cl. 60—272 4 Claims



1. An exhaust port liner assembly for a cylinder head having at least one exhaust port and at least one exhaust valve seat comprising:

a tubular exhaust port liner composed of spaced inner and outer tubular metal shells having a mass of heat insulating material within the spaced inner and outer shells,

said inner and outer shells being secured together adjacent the inlet port end thereof and having a space therebetween adjacent the outlet port end thereof, and

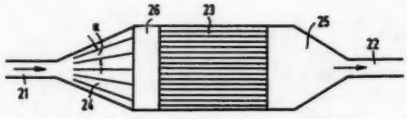
a gasket disposed within said space between the inner and outer shells adjacent the outlet port.

5,150,573

CATALYST ARRANGEMENT WITH FLOW GUIDE BODY

Wolfgang Maus, and Helmut Swars, both of Bergisch Gladbach, Fed. Rep. of Germany, assignors to Emitec Gesellschaft fuer Emissionstechnologie MBH, Lohmar, Fed. Rep. of Germany

Division of Ser. No. 469,565, Mar. 28, 1990, Pat. No. 5,103,641.
This application Dec. 30, 1991, Ser. No. 814,870
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3733402; claims priority, application European Pat. Off., Aug. 23, 1988, PCT/EP 88/00756
Int. Cl.[5] F01N 3/28
U.S. Cl. 60—299 18 Claims



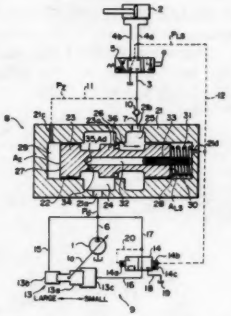
1. A catalyst configuration, comprising a catalyst body through which a fluid can flow in a flow direction, a diffusor disposed upstream of said catalyst body and widening in the flow direction, a converger disposed downstream of said catalyst body and narrowing in the flow direction, a flow guide body having an upstream end and a downstream end each with a given cross-sectional area, said flow guide body being disposed in said diffusor and having a multiplicity of channels through which a fluid can flow, at least some of said channels having an increasing cross section as seen in the flow direction, the cross-sectional area of said downstream end being greater than the cross-sectional area of said upstream end, and said flow guide body including catalytically active material.

5,150,574

HYDRAULIC DRIVE SYSTEM FOR CIVIL ENGINEERING AND CONSTRUCTION MACHINE

Toichi Hirata, Ushiku; Hideaki Tanaka, Tsuchiura; Genroku Sugiyama, Ibaraki, and Yusuke Kajita, Tsuchiura, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/00573, § 371 Date Sep. 24, 1990, § 102(e) Date Sep. 24, 1990, PCT Pub. No. WO90/13748, PCT Pub. Date Nov. 15, 1990
PCT Filed May 1, 1990, Ser. No. 573,138
Claims priority, application Japan, May 2, 1989, 1-112207
Int. Cl.[5] F16D 31/02
U.S. Cl. 60—465 13 Claims



1. A hydraulic drive system for a civil engineering and construction machine comprising a hydraulic pump, an actuator driven by a hydraulic fluid delivered from said hydraulic pump, a flow control valve disposed between said hydraulic pump and said actuator, a pressure compensating valve for controlling a differential pressure across said flow control valve, and pump delivery rate control means for controlling a flow rate of said hydraulic fluid delivered from said hydraulic pump dependent on a differential pressure between a pump pressure and a load pressure of said actuator, said pressure compensating valve including a valve body, first control means adapted to apply a first control force based on the differential pressure across said flow control valve to said valve body for urging said valve body in the valve-closing direction, and second control means adapted to apply a second predetermined control force to said valve body for urging said valve body in the valve-opening direction, wherein:

said pressure compensating further includes third control means adapted to apply third control force based on the differential pressure between said pump pressure and the load pressure of said actuator to said valve body for urging said valve body in the valve-opening direction for counteracting a flow force generated by a flow of hydraulic fluid through said pressure compensating valve.

5,150,575

HYDRAULIC BRAKE BOOSTER

Donald L. Parker, Middletown, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 22, 1991, Ser. No. 734,006
Int. Cl.[5] B60T 13/00; F15B 9/10
U.S. Cl. 60—547.1 1 Claim

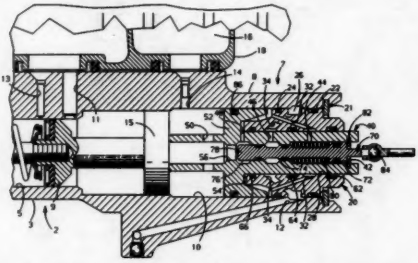
1. A low hysteresis hydraulic brake booster for a vehicle master cylinder which includes a longitudinal bore with a sealed piston mounted therein, the booster comprising:

frame means with a longitudinal bore being generally aligned and exposed to the bore of the master cylinder, and the frame having a first intersecting passage fluidly connected with a sump, the first intersecting passage being

generally at an end of the frame longitudinal bore adjacent to the master cylinder, and the frame having a second intersecting passage with the frame longitudinal bore spaced generally opposite from the first intersecting passage for influx of pressurized fluid;

a sleeve located at an end of the frame longitudinal bore opposite the master cylinder piston, the sleeve being fixably mounted within the frame longitudinal bore, the sleeve being sealed with the frame longitudinal bore at two places forming with the frame longitudinal bore a first seal annular chamber, the sleeve having an interior bore generally parallel with the frame longitudinal bore, the sleeve interior bore having a first intersecting passage fluidly connecting a portion of the sleeve interior bore generally opposite the master cylinder piston with an outer periphery of the sleeve at a portion of the sleeve more adjacent to said master cylinder piston than the first annular sealed chamber, and the sleeve having a second passage intersecting with the sleeve interior bore, the second intersecting passage fluidly connecting the sleeve interior bore with the first annular sealed chamber at a portion of the sleeve interior bore more adjacent to the master cylinder piston than the location of the intersection of the first interior retainer passage with the sleeve interior bore;

a power piston contacting the master cylinder piston and the sleeve with a portion slidably mounted within the interior bore of the sleeve, the power piston being generally in the



shape of a cross with a T-section and with a bore generally parallel with the sleeve interior bore, the T-section of the power piston having means of sealing with the longitudinal bore of the frame means, and the power piston having first, second, third and fourth radial passages intersecting with the interior bore of the power piston, the first radial passage when the power piston T-section is contacting the sleeve being generally aligned with the first intersecting passage of the sleeve, the second radical passage being generally aligned with the second intersecting passage of the sleeve and the third intersecting passage being generally adjacent an end of the sleeve most adjacent to the master cylinder piston, and a fourth radial passage intersecting the interior bore of the power piston with the longitudinal bore of the frame and exposed to the sump and being more adjacent to the master cylinder piston than the T-section of the power piston, and the power piston having an orifice generally parallel with the power piston interior bore axially juxtaposed between the third and fourth radial passages of the power piston, and the power piston having three means of sealing with the interior bore of the sleeve the first means of sealing being at an end of the sleeve interior bore generally opposite the master cylinder piston, a second means of sealing being located between intersections of the first and second intersecting passages of the sleeve with the sleeve bore, and a third means of sealing generally at an end of the sleeve most adjacent to the master cylinder piston juxtaposed when the power piston is contacting the sleeve between the second and third radial passages of the power piston;

and a spool valve operatively associated with an operator controlled brake panel of the vehicle having a first landing sealing off the interior of the power piston along and generally opposite the master cylinder piston, a second landing with means of sealing between the second and third radial bores of the power piston, and a third landing with means of sealing with the interior bore of the power piston between the second and third radial passages of the power piston and a head of the spool valve for sealing the orifice of the power piston;

a spring biasing the spool valve to a position away from the master cylinder mounted within the power piston whereby movement of the spool valve towards the master cylinder allows pressurized fluid to flow into the second sleeve intersecting passage through the second radial bore of the power piston around the second landing of the spool valve through the first radial bore of the power piston into the first intersecting passage of the sleeve and to force the power piston forward as the head of the spool valve closes off the orifice preventing the fluid from the side of the T-section of the power piston generally opposite the master cylinder piston from escaping through the third radial passage of the power piston through the orifice and then out the fourth radial passage to the sump.

5,150,576

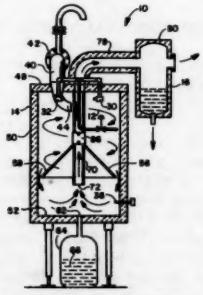
VAPOR COLLECTING APPARATUS

Richard A. Minzenberger, Chicago, Ill., assignor to Liquid Carbonic Corporation, Chicago, Ill.

Filed Nov. 16, 1990, Ser. No. 614,708

Int. Cl.[5] F26B *21/06*; B01D *47/00*; F28C *1/00*

U.S. Cl. 62—11 **8 Claims**



1. Apparatus for collecting a condensable vapor from a gas mixture including the vapor and a carrier gas, comprising:

a condenser vessel;

a first input means for inputting the gas mixture into the condenser vessel;

a second input means for inputting a cryogen component into the condenser vessel so as to condense the vapor;

a first output means for outputting a first portion of the condensed vapor from the condenser vessel, leaving a modified gas mixture with condensed vapor droplets entrained therein in the condenser vessel;

a second output means for outputting the modified gas mixture from the condenser vessel;

separator means coupled to the second output means for separating condensed vapor droplets from the modified gas mixture and for collecting the condensed vapor droplets; and

means disposed within the condenser vessel to divide the interior thereof into a turbulent flow region and a quiescent flow region;

wherein the first and second input means are located in the

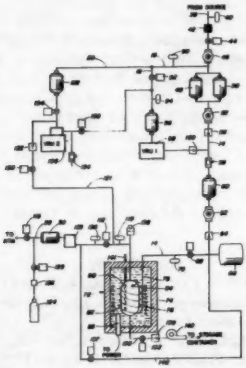
turbulent flow region and the first and second output means are located in the quiescent flow region.

5,150,577

SYSTEM AND METHOD FOR RECOVERING AND PURIFYING A HALOCARBON COMPOSITION

Mark D. Mitchell, 1313 Queen Anne Rd., Wilson, N.C. 27893, and David J. Spring, 25, Springate Field, Langley, England SL3 7DH

Filed Jun. 11, 1991, Ser. No. 713,970
Int. Cl.[5] F25J *3/04*
U.S. Cl. 62—18 **30 Claims**



1. A halocarbon recovery and purification system for removing nitrogen gas from a halocarbon composition source comprising:

a) a liquid heat exchange unit for holding a liquid heat transfer medium;

b) means for cooling the heat exchange unit and the liquid heat transfer medium therein;

c) a halocarbon recovery tank submerged in the heat exchange unit;

d) inlet means for transferring the halocarbon composition from the source into the recovery tank;

e) means for cooling the heat exchange unit, the liquid heat transfer medium therein, the recovery tank and the halocarbon composition therein to a sufficient level to separate nitrogen gas from the halocarbon composition; and

f) vent means associated with the recovery tank for venting the separated nitrogen gas from the recovery tank.

5,150,578

CRYOSTAT

Hisasi Oota, and Kazuki Moritsu, both of Akou, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Sep. 5, 1991, Ser. No. 755,240
Claims priority, application Japan, Sep. 5, 1990, 2-238691; Nov. 15, 1990, 2-307163
Int. Cl.[5] F17C *5/02*
U.S. Cl. 62—47.1 **32 Claims**

1. A cryostat comprising:

a cryogen container (2) for containing a liquid cryogen;

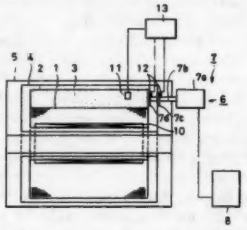
a refrigerator system (6) for recondensing a cryogen gas resulting from evaporation of the liquid cryogen;

a pressure sensor (11) for detecting the pressure of the interior of the cryogen container (2); and

pressure control means responsive to a detected pressure for maintaining the interior of the cryogen container (2) at a predetermined constant pressure, wherein said pressure control means comprises:

a heater (12) for heating the interior of the container; and

a pressure controller (13) responsive to a signal from the pressure sensor (11) for controlling energization of the



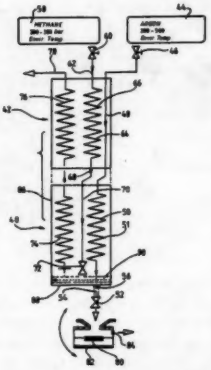
heater (12) to maintain the interior of the cryogen container (2) at a predetermined, constant pressure.

5,150,579

TWO STAGE COOLER FOR COOLING AN OBJECT

Uwe Hingst, Oberteuringen, Fed. Rep. of Germany, assignor to Bodenseewerk Gerätetechnik GmbH, Fed. Rep. of Germany

Filed Dec. 14, 1990, Ser. No. 628,186
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1989, 3941314
Int. Cl.[5] F25B *19/02, 9/10;* F25D *3/10;* H01L *23/46*
U.S. Cl. 62—51.2 **10 Claims**



1. A cooling apparatus for cooling an object, comprising:

a first cooler constituting an expansion cooler for cooling the object;

said first cooler containing a depressurization outlet;

a first gas source containing a pressurized first gas and connected to said first cooler;

a second cooler for precooling said pressurized first gas to a temperature below a predetermined inversion temperature of said pressurized first gas;

said depressurization outlet of said first cooler depressurizing and thereby further cooling said precooled pressurized first gas;

said depressurization outlet of said first cooler being associated with said object and directing said depressurized and further cooled first gas toward said object for cooling said object;

said object to be cooled being arranged to vent said depressurized first gas after heat exchange of said first gas with said object;

said second cooler constituting a Joule-Thomson cooler containing a depressurization nozzle;

a second gas source containing a pressurized second gas and connected to said second cooler;

said depressurization nozzle of said second cooler depressurizing and thereby cooling said second gas;

said second cooler further containing a countercurrent heat exchanger disposed upstream of said depressurization nozzle of said second cooler;

said countercurrent heat exchanger of said second cooler precooling said pressurized second gas infed into said second cooler from said second gas source,

by means of said depressurized and cooled second gas originating from said depressurization nozzle;

said first cooler further containing a heat exchanger disposed upstream of said depressurization outlet of said first cooler; and

said heat exchanger of said first cooler receiving said pressurized first gas from said first gas source for heat exchange exclusively with said depressurized and cooled second gas originating from said depressurization nozzle of said second cooler in order to thereby precool said pressurized first gas to said temperature below said predetermined inversion temperature.

5,150,580

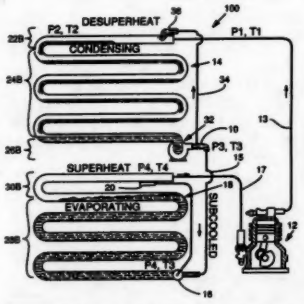
LIQUID PRESSURE AMPLIFICATION WITH SUPERHEAT SUPPRESSION

Robert E. Hyde, 2229 SE. 170th, Portland, Oreg. 97233

Filed Mar. 8, 1991, Ser. No. 666,251

Int. Cl.[5] F25B *9/00*

U.S. Cl. 62—86 **22 Claims**



1. An air-conditioning or refrigeration system comprising:

a compressor, a condenser, an expansion valve, an evaporator, and conduit means interconnecting the compressor, condenser, expansion valve and evaporator in series in a closed loop for circulating refrigerant therethrough, the conduit means including:

first conduit means coupling an outlet of the compressor to an inlet to the condenser to convey superheated vapor refrigerant from the compressor into the condenser at a first pressure and temperature;

centrifugal pump means having an inlet coupled to an outlet of the condenser for receiving condensed liquid refrigerant at a second pressure less than said first pressure and boosting the second pressure of the condensed liquid refrigerant by a substantially constant increment of pressure within a predetermined range to discharge the condensed liquid refrigerant from an outlet of the pump means at a third pressure greater than said second pressure;

second conduit means coupling the outlet of the pump means to an inlet to the expansion valve to transmit a first portion of the condensed liquid refrigerant from outlet of the pump means at said third pressure through the expansion valve into the evaporator to vaporize and effect cooling for air conditioning or refrigeration; and

third conduit means coupling the outlet of the pump means to the condenser to transmit a second portion of the condensed liquid refrigerant from outlet of the pump means into the condenser together with the superheated vapor refrigerant to vaporize therein and effect cooling of the superheated vapor refrigerant entering the condenser to a reduced temperature, thereby reducing said first pressure.

5,150,581

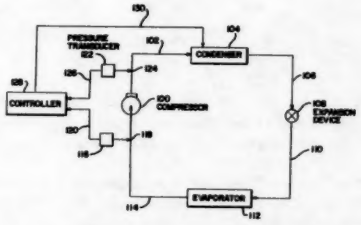
HEAD PRESSURE CONTROLLER FOR AIR CONDITIONING AND REFRIGERATION SYSTEMS

Glenn W. Smith, Mt. Airy, Md., assignor to Baltimore Aircoil Company, Baltimore, Md.

Filed Jun. 24, 1991, Ser. No. 720,023

Int. Cl.[5] F25B *39/04*

U.S. Cl. 62—115 **12 Claims**



1. A method of controlling the head pressure in a refrigeration or air conditioning system comprising the steps of:

measuring a suction pressure of a working fluid at a point just prior to the working fluid entering a compressor means,

converting said suction pressure into a first signal,

transmitting said first signal to a controller means,

calculating an internal discharge pressure of the compressor by multiplying the first signal representing the suction pressure by a signal representing the internal pressure ratio of the compressor,

measuring a discharge line pressure of the working fluid at a point just after the compressor means outlet,

converting said discharge line pressure into a second signal,

transmitting said second signal to the controller means,

then comparing the calculated internal discharge pressure with the second signal representing the discharge line pressure;

if the absolute value of the difference between the internal discharge pressure and the discharge line pressure is less than a pre-set tolerance, operating in a first mode whereby the controller means does not output any control signal to change the capacity of the condenser means,

if the absolute value of the difference between the internal discharge pressure and the discharge line pressure is greater than the pre-set tolerance, and if the internal discharge pressure is greater than the discharge line pressure, operating in a second mode to decrease the capacity of the condenser means, thereby increasing the discharge line pressure to within the pre-set tolerance of the internal discharge pressure,

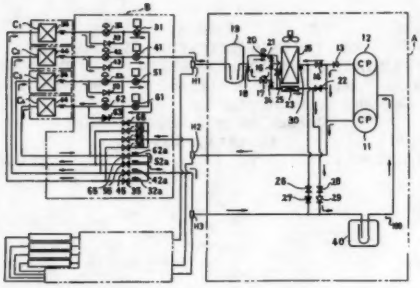
and if the absolute value of the difference between the internal discharge pressure and the discharge line pressure is greater than the pre-set tolerance, and if the internal discharge pressure is less than the discharge line pressure, operating in a third mode to increase the capacity of the condenser means, thereby decreasing the discharge line pressure to within the pre-set tolerance of the internal discharge pressure.

5,150,582

MULTIPLE AIR CONDITIONING APPARATUS

Yukifumi Gotou, Shizuoka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 31, 1991, Ser. No. 648,645
Claims priority, application Japan, Feb. 14, 1990, 2-31483
Int. Cl.[5] F25D *21/00*
U.S. Cl. 62—155 13 Claims



1. A multiple air conditioning apparatus having at least one outdoor unit and a plurality of indoor units comprising:

a compressor disposed in said outdoor unit for compressing a refrigerant fluid;

a main outdoor heat exchanger arranged in said outdoor unit, the main outdoor heat exchanger being connected to said compressor;

an auxiliary outdoor heat exchanger arranged in vicinity of said main outdoor heat exchanger, said auxiliary outdoor heat exchanger being connected to said compressor;

means for diverting refrigerant from said auxiliary outdoor heat exchanger except during cooling operation mode and during defrosting of said main outdoor heat exchanger;

a plurality of indoor heat exchangers arranged in said indoor units respectively; and

means for defrosting said main outdoor heat exchanger, wherein in heating operation, said defrosting means supplies said refrigerant discharged from said compressor to said main outdoor heat exchanger and said indoor heat exchangers, and returns said refrigerant which has passed through said main outdoor heat exchanger and said indoor heat exchangers to said compressor through said auxiliary outdoor heat exchanger.

5,150,583

APPARATUS FOR CONTROLLING A DUAL EVAPORATOR, DUAL FAN REFRIGERATOR WITH INDEPENDENT TEMPERATURE CONTROLS

Heinz Jaster, and Warren F. Bessler, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 739,364, Aug. 2, 1991, Pat. No. 5,109,678, which is a division of Ser. No. 561,044, Aug. 1, 1990, Pat. No. 5,056,328, which is a division of Ser. No. 293,034, Jan. 3, 1989, Pat. No. 4,966,010. This application Feb. 12, 1992, Ser. No. 834,089
Int. Cl.[5] F25D *17/00*
U.S. Cl. 62—179 1 Claim

1. A refrigerator apparatus comprising:

a freezer compartment;

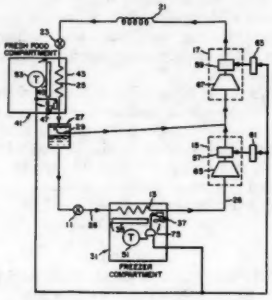
a fresh food compartment;

a refrigerator system having a compressor, a condenser, a first expansion valve, a first evaporator situated in said freezer compartment, a second expansion valve, a second evaporator situated in said fresh food compartment said refrigerator system elements connected in series in a closed loop in a refrigerant flow relationship;

a first fan situated in said freezer compartment for providing air flow over said first evaporator;

a second fan situated in said fresh food compartment for providing air flow over said second evaporator;

a first thermostatic controller situated in said freezer compartment for maintaining a desired temperature in said



freezer compartment by causing said first fan to operate as necessary when said compressor is operating; and

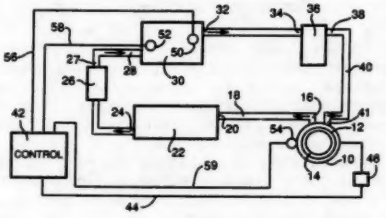
a second thermostatic controller situated in said fresh food compartment for maintaining a desired temperature in said fresh food compartment by causing said compressor and said second fan to operate.

5,150,584

METHOD AND APPARATUS FOR DETECTING LOW REFRIGERANT CHARGE

Glenn E. Tomasov, Lockport, and Annette M. Schmidt, Amherst, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 26, 1991, Ser. No. 765,794
Int. Cl.[5] F25B *1/00*
U.S. Cl. 62—209 5 Claims



1. In an air conditioning system having a compressor, a condenser, and an evaporator, the evaporator having refrigerant inlet and outlet ends normally at different temperatures, and the system containing a refrigerant which carries a lubricant to lubricate the compressor; control apparatus for protecting the system against loss of refrigerant comprising:

a first sensor on the compressor for sensing the compressor temperature and having a first output signal;

a second sensor for sensing the temperature at the inlet end of the evaporator and having a second output signal;

a third sensor for sensing the temperature at the outlet end of the evaporator and having a third output signal; and

control means for determining the temperature differential across the evaporator from the second and third output signals and for issuing a signal when the temperature differential is below a first threshold indicative of low refrigerant charge and the first output signal is above a

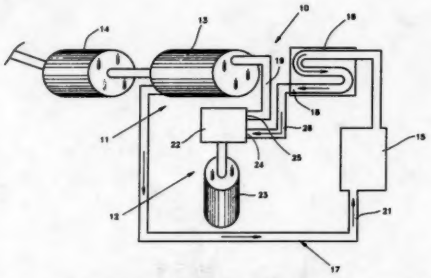
second threshold indicative of abnormal compressor temperature.

5,150,585

ENERGY RECOVERY SYSTEM FOR COLD STORAGE WAREHOUSE

Stanley Markiewicz, 842 Shoreview Dr., Henderson, Nev. 89015

Filed Apr. 17, 1991, Ser. No. 687,583
Int. Cl.[5] F25B *9/00*; F25D *9/00*
U.S. Cl. 62—467 **20 Claims**



1. An energy recovery system, comprising a combination of a refrigeration apparatus including refrigerant compressor, condenser and evaporator components operatively connected by a first conduit system forming a refrigerant flow circuit through which refrigerant is cycled with the refrigerant passing through fluid, vapor and gaseous stages,

a motor for actuating the compressor to effect compression of the refrigerant,

the motor being coupled to the compressor by a thermostatically controlled clutch,

and an energy recovery unit including an electromotive generator coupled to a turbine for extracting kinetic energy from refrigerant flowing through the first conduit system,

the turbine having a refrigerant suction intake and a refrigerant exhaust outlet connected to the conduit system,

wherein kinetic energy extracted from refrigerant flow channelled through the turbine from the turbine suction intake and exhausted through the turbine exhaust outlet impels rotation of the turbine to drive the electromotive generator,

and at least one auxiliary voltage generator is coupled to the motor for rotation thereby to produce electricity independently of the turbine driven electromotive generator upon the energy recovery unit being rendered inoperative when the refrigeration compressor is declutched from the motor.

5,150,586

SYSTEM AND PROCESS OF COMPRESSING MISCIBLE FLUIDS

Narcizo O. Basseggio, Rua Pensilvania, 354/13, Sao Paulo, Brazil SP-04564

Filed Nov. 9, 1990, Ser. No. 611,024
Claims priority, application Brazil, Nov. 16, 1989, 8905970
Int. Cl.[5] F25B *43/02*; F04B *39/02*
U.S. Cl. 62—468 **14 Claims**

1. A system of parallel compressors for compressing fluids miscible with oil, comprising:

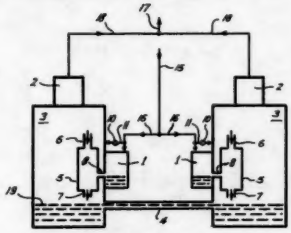
a plurality of compressors connected in parallel;

a suction chamber, a discharge chamber, a crankcase chamber and an ejector contained within each said compressor and independent of one another, said ejector including return lubricating oil means used to create an ejector motive force;

conduit means for connecting the crankcase chambers in oil and gas flow communication with one another;

a suction manifold connected to each said suction chamber;

capillary means connected between said suction manifold and said crankcase chambers for equalizing the pressure of



each said crankcase chamber with the pressure of said suction manifold; and

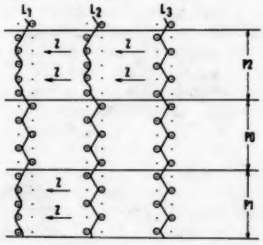
means connected between said ejector and said suction chamber within each said compressor for transferring the oil level between said crankcase chamber and said suction chamber.

5,150,587

WARP KNITTING MACHINE PROCESS AND THE PILE WARE PRODUCED THEREBY

Gerhard Bergmann, Heusentstamm, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertschausen, Fed. Rep. of Germany

Filed Jan. 8, 1991, Ser. No. 638,640
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1990, 4001621
Int. Cl.[5] D04B *21/02*
U.S. Cl. 66—195 **15 Claims**



1. A warp knitting machine for producing pile ware with threads, comprising:

a pile sinker bar having a plurality of pile sinkers displaceable in the longitudinal direction, said pile sinkers being operable to hold and be encircled by pile loops; and

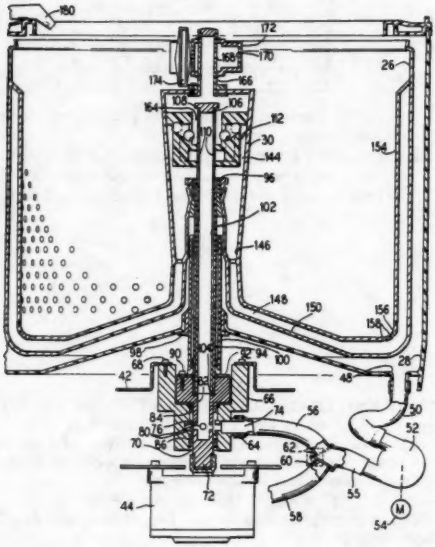
at least two guide bars each having a plurality of guides, at least one of said guide bars (a) having jacquard guide means for displacing its guides and (b) being arranged to shog by an amount that selectively produces, in dependence upon the jacquard guide means, either ground ware or pile loops, ground ware being formed by laying the threads without crossing over said pile sinkers, pile loops being formed by laying the threads across the pile sinkers.

5,150,588

CONCENTRATE WASH AUTOMATIC WASHER WITH RECIPROCATING BASKET

Devinder Singh, St. Joseph; Anthony H. Hardaway, Lincoln Township, Berrien County; John W. Euler, St. Joseph, and Jim J. Pastryk, Weesaw Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 28, 1990, Ser. No. 635,777
Int. Cl.[5] D06F *39/08*
U.S. Cl. 68—23.5 **13 Claims**



10. An automatic washer for laundering a textile wash load comprising:

a rotatable wash zone including a peripheral wall;

means for providing agitation to said wash load within said wash zone comprising means for oscillating said peripheral wall and means associated with said wall for imparting an agitation force to said wash load;

means for introducing said wash load into said wash zone;

means for rotating said wash load and said peripheral wall at a speed that is sufficient to maintain said load against said peripheral wall;

spray means mounted centrally within said wash zone for directing a detergent solution against said wash load;

means for continuously passing a concentrated detergent solution, in the range of not less than approximately 0.5% to 4% detergent concentration, through said spinning wash load in the absence of mechanical agitation of said wash load during at least a portion of the time said load is being spun so that the total effective amount passed through is greater than the amount necessary to saturate said wash load;

means for introducing water to said wash zone to dilute said detergent solution;

means for agitating said load in said dilute detergent solution for a second predetermined period; and

means for rinsing said detergent solution from said wash load;

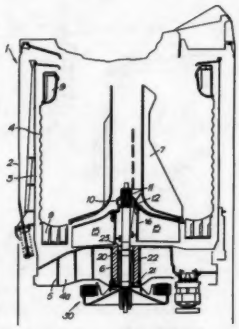
said spray means being mounted on a post which is rotatable with said wash zone.

5,150,589

LAUNDRY MACHINE

John J. A. Williams; Frank W. Shacklock, and Keith D. Ferguson, all of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Division of Ser. No. 412,309, Sep. 26, 1989, Pat. No. 5,040,285.
This application Jun. 4, 1991, Ser. No. 709,967
Claims priority, application New Zealand, Sep. 28, 1988, 226374
Int. Cl.[5] D06F *37/40*
U.S. Cl. 68—23.7 **12 Claims**



1. A clothes washing machine including a cabinet and a stationary water container mounted in the cabinet and having a base and a side wall, comprising:

a plurality of downwardly extending ribs on said base;

a bearing tube on said base supported by said ribs;

a pair of vertically spaced bearings mounted in said bearing tube;

a vertical shaft rotatably mounted in said bearings;

a seal between said shaft and said tube mounted above said bearings;

an agitator mounted on said shaft for rotation therewith;

a perforated spin tub within said container;

spin tub bearing means mounted on said shaft for rotatably supporting said spin tub;

a drive system comprising an electric motor having a stator and a rotor and driving means including said vertical shaft to rotatably oscillate said agitator to rotate said spin tub and said agitator together in one direction;

said stator of said motor being fixed to said container and said rotor being fixed to said shaft in a manner so that said spaced bearings act as bearings providing relative rotation of said stator and rotor of said electric motor; and

interconnecting means between said spin tub and said agitator adapted on appropriate operation of operating means to interconnect said spin tub and said agitator for rotation together in one direction by said shaft to produce a spin action and to disconnect said spin tub from said agitator so that only said agitator is rotatably oscillated by rotating oscillation of said rotor to produce a washing action.

5,150,590

EJECTIVELY OPENABLE LATCH FOR LUGGAGE

Chong-Kuan Ling, c/o Sinox Co., Ltd. P.O. Box 96-156, Taipei, Taiwan

Filed Apr. 23, 1991, Ser. No. 689,541
Int. Cl.[5] E05B *65/52*
U.S. Cl. 70—69 **3 Claims**

1. A latch for luggage comprising:

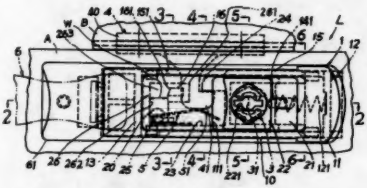
a housing secured on a first luggage body;

a trigger means slidably held in said housing including a push button protruded frontwardly from a front portion of the

trigger means normally sidewardly urged by a restoring spring retained in a first side plate of said housing towards a second side plate of said housing opposite to said first side plate;

a lock means mounted in said trigger means including a lock bolt eccentrically secured to a rear portion of said lock means operatively rotatively biased towards said first side portion of said housing to be retarded by a limiting block formed in said housing for locking said trigger means or rotatively oppositely biased to separate from the limiting block ready for opening said trigger means;

a latch means having a latch base secured to a second luggage body pivotally combinable and coverable with said first luggage body, and a hook portion protruding downwardly to be lockable and engageable with a recess portion formed in a hook socket formed in said trigger means normally urged upwardly by an ejecting spring held in



said socket of said trigger means, whereby upon an opening of said lock means for rotatively biasing said lock bolt to separate from said limiting block and a sliding of said trigger means to disengage the recess portion of said trigger means from said hook portion of said latch means, said hook portion will be resiliently ejected upwardly by said ejecting spring to automatically open said second luggage body from said first luggage body; and

said trigger means including an inversion preventing means for preventing unlocking of the latch and locking means when turning a luggage upside down having an inversed-L-shaped ball slot formed in said trigger means including: a horizontal slot having a wedge block secured on a front plate of said housing located in the horizontal slot, a vertical slot perpendicular to the horizontal slot for slidably holding a ball in the vertical slot, and a right-angle corner portion defined between the horizontal slot and the vertical slot.

5,150,591

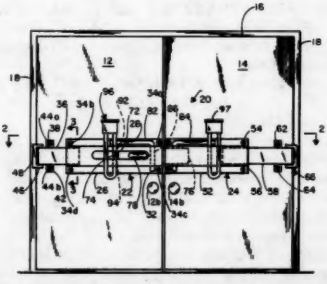
NORDEN DOUBLE DOOR LOCK

Howard P. Norden, Jr., 3 Crest Hill Pl., Smithtown, N.Y. 11787

Filed Mar. 25, 1991, Ser. No. 674,108

Int. Cl.[5] E05B *65/06*

U.S. Cl. 70—129 **5 Claims**



1. A door locking mechanism for use on a pair of outswinging doors mounted in an opening formed by a frame in which said doors are hinged at opposite edges thereof and having free edges adjacent each other and free to be moved between an open and closed position, said mechanism comprising a first extended member U-shaped in cross section having a pocket facing the first of said doors and having a flange for attaching said first member to the aforesaid first door, said first member extending horizontally with one end terminating substantially flush with the free edge of said first door and permitting the free edge of the second door to move, latching means mounted for sliding movement within said pocket of said first member, said latching means being provided with a handle, said first member having a slot to permit said handle to pass through said slot and extend out of said first member whereby said handle can be employed to move said latching means within said pocket, said slot being of sufficient length to permit said latching means to be moved between a closed position wherein said latching means extends past the free edges of said doors to overlap said second door and an open position where said latching means is positioned so as not to interfere with movement of said second door, first lever means mounted in said first member rotatable between a first position clamping said latching means against said member and a second position releasing said latching means for free movement within said pocket, an opening passing through said first U-shaped member located so that when said latching means is in its closed position said handle is located within said slot between said opening and the free edge of said first door, and when said latching means is in its open position said handle is located on the other side of said opening, locking means for insertion through said opening to lock said latching means in either said open or closed position, a second extended U-shaped member having a pocket mounted on said second door aligned with said first member and having an end flush with the free edge of said second door for receiving said latching means when said latching means is in its closed position, and second lever means being rotatable between a first position clamping said latching means against said second member and a second position unclamping said latching means.

5,150,592

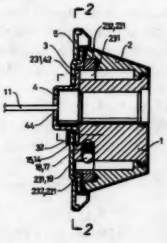
LOCKING DEVICE FOR AN AUXILIARY LOCK

Jui C. Lin, Kaohsiung Hsien, Taiwan, assignor to Taiwan Fu Hsing Industry Co., Ltd., Kaohsiung, Taiwan

Filed Dec. 2, 1991, Ser. No. 800,979

Int. Cl.[5] E05B *9/04*

U.S. Cl. 70—190 **1 Claim**



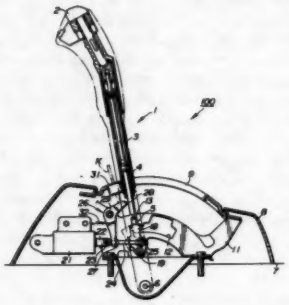
1. A locking device comprising a key cylinder lock, a rotatable ring, a base and an actuating wheel combined together, said lock being additionally provided with a lateral hole for fitting therein a spring and a steel ball elastically pushed by the spring to extend out of the lateral hole a little and to engage with side faces of two adjacent teeth around a toothed ring provided in an inner peripheral surface of the rotatable ring, said toothed ring and the rotatable ring being able to rotate together.

5,150,593

SHIFT LEVER DEVICE FOR AUTOMATIC TRANSMISSION

Tsutomu Kobayashi, and Kazuo Kojima, both of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,281
Claims priority, application Japan, Mar. 4, 1988, 63-28857
Int. Cl.[5] B60R *25/06*
U.S. Cl. 70—248 4 Claims



1. A shift lever device for use with an automatic transmission, comprising:

a shift lever having a lock pin and reversibly movable from a parking position to a selected one of a plurality of gear range positions;

a guide plate disposed at least along a range of movement of said shift lever and having a first recess for receiving said lock pin therein, said first recess corresponding to said parking position, and a second recess region corresponding to said plurality of gear range positions, said first recess and second recess region being defined in said guide plate, such that said guide plate allows said lock pin to move through said first recess and second recess region in response to movement of said shift lever;

a lock plate movable for selectively locking said lock pin in said first recess and releasing said lock pin for movement from said first recess;

an actuator for actuating said lock plate to lock and release said lock pin;

release means operable for actuating said lock plate independently of said actuator, in order to release said lock pin for movement from said first recess, wherein said release means is operable manually by a key; and

wherein said actuator comprises a solenoid having a return spring and a rod coupled between said return spring and said lock plate for actuating said lock plate to lock said lock pin in said first recess under the bias of said return spring when said solenoid is de-energized, and wherein said release means includes means for urging said rod to move said lock plate against the bias of said return spring in order to release said lock pin for movement from said first recess.

5,150,594

MACHINE FOR BEADING CYLINDRICAL CANS OR CAN BODIES

Luigi Pazzaglia, Bologna, Italy, assignor to Cefin S.p.A., Bologna, Italy

Filed Nov. 20, 1990, Ser. No. 616,107
Claims priority, application Italy, Nov. 29, 1989, 3732 A/89
Int. Cl.[5] B21D *17/04*
U.S. Cl. 72—92 14 Claims

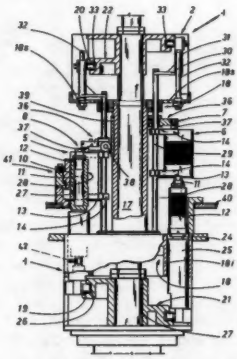
1. A machine for beading cylindrical cans or can bodies, comprising:

a revolving head or carousel rotatable about a vertical axis and comprising a plurality of work stations passing singly and in succession through a station at which unbeaded can bodies are fed in and a station at which beaded can bodies run out;

means associated with each of the work stations, by which a can body is supported during passage of the work station from the infeed station to the runout station;

fixed reaction means, extending substantially parallel with and externally of the trajectory followed by a can body carried by the support means of each work station, of which an internal face is positioned to enter into contact with a can body during passage of the work station from the infeed station to the runout station and bears a beaded profile with which the can body is to be invested;

means associated with each of the work stations and positioned so as to constrain a single can body during its passage from the infeed station to the runout station, embodied essentially as a revolving mandrel comprising a vertical center shaft ensheathed by a removable barrel of which the external diameter is significantly less than the internal diameter of the can body and of which an external surface affords a profile complementary to that of the fixed reaction means, in such a way that a can body constrained forcibly between the revolving mandrel and the fixed reaction means will be deformed and invested with an beaded profile during passage of the work station from the infeed station to the runout station;



means by which the mandrel and the support means of each work station are moved toward and away from one another through a distance substantially equal to half the height of the can body.

5,150,595

PROCESS AND APPARATUS FOR WORKING AN EDGE PORTION OF A CONTAINER FLANGE

Eugen F. Ihly, Denver, Colo., assignor to Ihly Industries, Inc., Englewood, Colo.

Filed May 9, 1991, Ser. No. 697,751
Int. Cl.[5] B21B *19/14*
U.S. Cl. 72—124 26 Claims

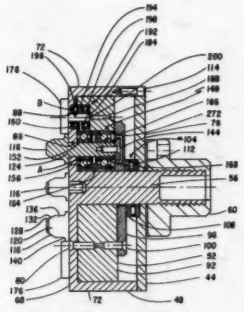
1. An apparatus for working an edge portion of a flange, said flange extending in a first direction and being positioned on an open end of a container body, said container body having a longitudinal axis with said flange extending away from said longitudinal axis of the container body, comprising:

a housing having a central axis;

a plurality of rotatable rollers mounted on said housing and circumferentially positioned about said central axis of said housing, said rollers being radially outwardly from the flange edge of the container body when said central axis of said housing and the longitudinal axis of the container

body are substantially aligned, said rollers each having a working surface;

rotational driving means associated with said apparatus for imparting rotation to at least one of said container body or said housing to cause relative rotational motion between the container body about its longitudinal axis and said rollers about said central axis of said housing; and



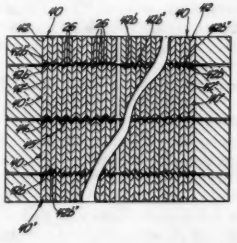
forcing means associated with said housing radially inwardly of said rollers and positionable inside the open end of the container body, for forcing the edge of said alone of the container body radially outwardly toward said rollers, wherein said working surface of each of said rollers engagable with the edge portion is disposed to substantially restrict movement of the flange edge in the first direction and to work the edge portion when engaged therewith.

5,150,596

HEAT TRANSFER FIN WITH DAMMED SEGMENTS

Terry J. Hunt, Lockport, and Michael A. Breda, East Amherst, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 11, 1991, Ser. No. 728,419
Int. Cl.[5] B21D *13/04*
U.S. Cl. 72—186 **4 Claims**



1. In a method for forming an air center for a tube and convoluted fin heat exchanger in which a flat strip of roll stock is directed through a pair of rotatable forming discs the steps of:

preshaping the pairs of forming discs to have a series of convolution forming and louver cutting teeth; shaping intermittent ones of cutting teeth to form a dammed convolution panel in the roll stock directed therethrough;

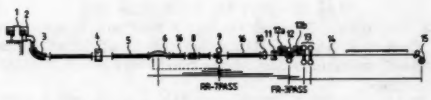
rotating the discs for forming first and second series of convoluted panels in the roll stock having louvers while generating a periodic dammed panel in the convolutions.

5,150,597

HOT STRIP PLANT

Teruo Sekiya, Takahagi; Tomoaki Kimura, Hitachi, and Sadao Nishimura, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 10, 1991, Ser. No. 698,390
Claims priority, application Japan, Jun. 12, 1990, 2-152991
Int. Cl.[5] B21B *1/34*
U.S. Cl. 72—229 **4 Claims**



1. A hot strip plant, comprising:

a reversing roughing mill; and

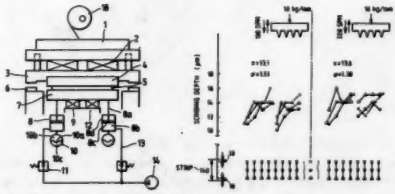
a finishing mill, comprising a reversing finishing stand immediately preceeding two tandem unidirectional six-high rolling stands with relatively small diameter work rolls, said finishing mill being disposed downstream to and at an exit side of said roughing mill, whereby said two six-high rolling stands provide for improved shape control.

5,150,598

APPARATUS FOR SCRIBING GRAIN-ORIENTED ELECTRICAL STEEL STRIP

Takayuki Uchida; Satoshi Ide; Masahiro Yamamoto, and Atsushi Yumoto, all of Kitakyushu, Japan, assignors to Nippon Steel Corp., Tokyo and Nittetsu Plant Designing Corp., Kitakyushu, both of, Japan

Continuation-in-part of Ser. No. 480,824, Feb. 16, 1990, abandoned. This application Aug. 22, 1991, Ser. No. 750,759
Claims priority, application Japan, Feb. 20, 1989, 1-38424
Int. Cl.[5] B21D *28/10, 28/20, 28/18*
U.S. Cl. 72—325 **10 Claims**



1. An apparatus for scribing grain-oriented electrical steel strip which comprises:

a movable die;

a drive unit to reciprocate the movable die;

a fixed die positioned opposite to and within the stroke of the movable die;

a scribing tool having linear teeth that is attached to at least either of the movable and fixed dies, the scribing tool forming linear impressions on strip to the desired depth held either between a die and a scribing tool or between two scribing tools;

a plurality of cylinders each having a piston and piston rod with the piston rods thereof supportingly connected to the fixed die, each cylinder having a back pressure side which increases in pressure by movement of said piston in each cylinder as a result of the scribing tool pressing against said strip; and

an accumulator individually connected to the back pressure side of each cylinder, the accumulator divided into two chambers by a diaphragm, one of the chambers filled with a hydraulic fluid, the hydraulic fluid chamber communicating directly with the back pressure side of the cylinder

with the piston of the cylinder and the diaphragm of the accumulator spaced apart from each other by a distance by which the time the pressure wave spreading throughout the hydraulic fluid takes in traveling from the piston to the diaphragm of the accumulator is kept shorter than the time the teeth of the scribing apparatus takes in reaching the desired depth.

5,150,599

TREATMENT OF METAL SLABS

Geoffrey Wilson, Fulwood; Timothy J. Bradshaw, Bradway, and Kenneth T. Lawson, Hathersage near Sheffield, all of England, assignors to Davy Mckee (Sheffield) Limited, Sheffield, England

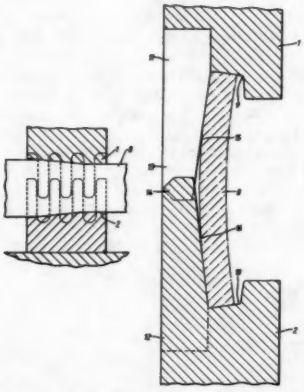
PCT No. PCT/GB89/00986, § 371 Date Apr. 15, 1991, § 102(e) Date Apr. 15, 1991, PCT Pub. No. WO90/02003, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 24, 1989, Ser. No. 659,345

Claims priority, application United Kingdom, Aug. 26, 1988, 8820296; Apr. 14, 1989, 8908448

Int. Cl.[5] B21J *13/02*; B21B *15/00*

U.S. Cl. 72—399 **13 Claims**



1. A pressing machine comprising

two platens positioned one above the other with at least one of said platens being reciprocatable vertically with respect to the other platen;

means to incrementally feed a hot elongate metal slab in the direction of its length with its width dimension extending substantially vertical and its thickness dimension extending substantially horizontal between the platens so that the platens are engageable with respective upper and lower opposite sides of the slab;

a restraint positioned adjacent to, and horizontally to one side of, the portion of the slab which, in use, is being pressed between the platens so as to control the buckling of the slab in the horizontal direction towards the restraint, the vertical dimension of the restraint being substantially equal to the width dimension of said portion of the slab and being variable so as to accommodate slabs which, before pressing, are of different width dimensions;

and whereby, as a hot elongate metal slab is incrementally fed between the platens, at least said one platen is vertically reciprocated during successive feeding of the slab to cause the platens to engage said upper and lower opposite sides of the slab to reduce the width dimension of the slab and the buckling of the portion of the slab which is being pressed is controlled by the restraint.

5,150,600

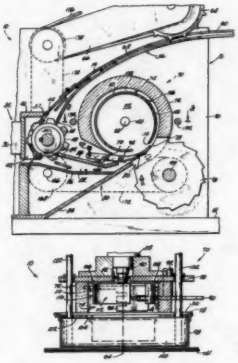
RESILIENT MEMBER NESTING APPARATUS

Horst Wentzek, and Michael Kozak, both of Kenosha, Wis., assignors to Frank L. Wells Company, Kenosha, Wis.

Filed Jan. 22, 1991, Ser. No. 643,725

Int. Cl.[5] B21D *45/00*; B21F *35/04*

U.S. Cl. 72—426 **24 Claims**



1. A nesting apparatus for positioning resilient members in nested relation, said nesting apparatus comprising a frame, means stationarily mounted on said frame for defining a primary chamber adapted to receive a resilient member, means fixed on said frame against movement relative to said frame for defining a secondary chamber adapted to receive resilient members from said primary chamber, means on said frame for feeding resilient members one at a time into said primary chamber, means on said frame for transferring resilient members one at a time from said primary chamber to said secondary chamber to form a nested complement of the resilient members in said secondary chamber, a closure adapted to contain the resilient members within said secondary chamber, and means for displacing said closure to a position affording removal of said resilient members from said secondary chamber.

5,150,601

FLUID SAMPLING FOR GAS CHROMATOGRAPH WITH MODIFIED SAMPLING VALVE

David L. Simeroth, Lake Jackson, Tex.; David S. Brink, Antioch, Calif.; Reid S. Willis, Martinez, Calif., and Dale J. Backlund, Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 21, 1990, Ser. No. 631,553

Int. Cl.[5] G01N *1/14*

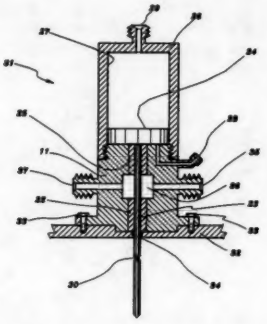
U.S. Cl. 73—23.41 **3 Claims**

1. A process analysis method which is a new use for a process gas chromatography liquid injection valve of the type having a distal heated vaporization chamber portion, a sample chamber portion, a valve stem bore intersecting both chambers, a grooved valve stem positioned within the valve stem bore and a means for moving the valve stem back and forth in the valve stem bore, the vaporization chamber portion of the valve being removed and discarded, the remainder of the valve containing the remaining chamber portion being mounted on a process conduit containing a process liquid or being mounted on a process vessel containing a process liquid, the method comprising the steps of:

(a) flowing a stream of carrier gas through the remaining chamber of the valve to an analyzer;

(b) extending the valve stem from the valve so that the groove is positioned outside the valve and into the process liquid so that the process liquid can fill the groove in the valve stem; and

(c) retracting the valve stem into the valve so that the groove is positioned within the remaining chamber so that



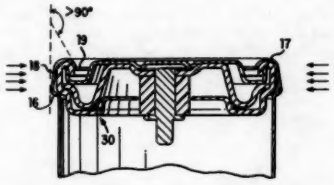
the liquid in the groove can evaporate into the carrier gas and be carried to the analyzer.

5,150,602

CRIMPING METHOD FOR ELECTROCHEMICAL CELLS

Robert J. Payne, Wellesley, Mass., and Robert A. Yoppolo, Woonsocket, R.I., assignors to Duracell Inc., Bethel, Conn.

Filed Sep. 10, 1990, Ser. No. 580,069
Int. Cl.[5] H01M *2/04*
U.S. Cl. 29—623.2 **12 Claims**



1. An improved method for sealing a cylindrical electrochemical cell having an open ended metal container comprising placing a circular, resilient sealing member in the open end of the container and onto an outwardly directed step near the open end with the top of the sealing member being placed below the upper edge of container; folding the edge of the container inwardly over a peripheral rib of the sealing member and simultaneously compressing said rib between the folded container edge and the container wall and holding said member downwardly onto the step; and reducing the diameter of the stepped portion of the container to the same as that of the remainder of the container whereby the diameter of the sealing member is reduced and said member is compressingly held in place.

5,150,603

HYDROCARBON VAPOR SENSOR AND SYSTEM

Robert A. Boenning, Timonium, and David L. Blair, Cockeysville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

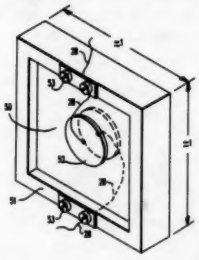
Filed Dec. 13, 1991, Ser. No. 819,896
Int. Cl.[5] G01N *27/12*; G01M *3/16*
U.S. Cl. 73—31.05 **7 Claims**

1. A hydrocarbon vapor sensor, comprising:

a sensor mount having members for supporting an elastomeric material on all edges;

an elastomeric matrix mounted to said sensor mount having a resistance responsive to hydrocarbon vapor and including metal coated glass spheres;

comparator means for receiving a voltage when said elastomeric matrix senses hydrocarbon vapor, for comparing said voltage with a predetermined threshold voltage and for outputting a signal;



latch means for outputting a signal indicating hydrocarbon vapor has been sensed in accordance with the output signal from said comparator means; and

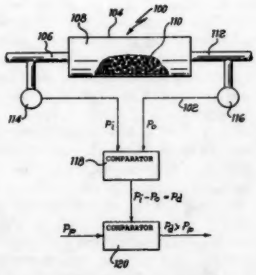
display means for providing a readout indicative of the sensed hydrocarbon vapor.

5,150,604

METHOD FOR DETERMINING THE END OF USEFUL LIFE OF AN INERT GAS PURIFIER AND APPARATUS THEREFORE

Marco Succi, and Fabrizio Doni, both of Milan, Italy, assignors to Saes Getters SpA, Milan, Italy

Filed Nov. 13, 1990, Ser. No. 611,652
Claims priority, application Italy, Jan. 5, 1990, 19012 A/90
Int. Cl.[5] G01N *15/00*
U.S. Cl. 73—38 **21 Claims**



1. An apparatus for determining the end of useful life of an inert gas purifier (**104**) having an impure inert gas inlet (**106**) in fluid communication with a housing (**108**) containing a gas sorbing material (**110**), said housing being in fluid communication with a purified gas outlet (**112**), said apparatus comprising:

A. a means (**114**) for measuring the gas pressure (P1) at the inlet (**106**), and

B. a means (**116**) for measuring the gas pressure (Po) at the outlet (**112**); and

C. a means (**118**) for determining the gas pressure difference (Pd = P1 − Po) between the inlet (**106**) and the outlet (**112**); and

D. a means (**120**) for comparing (Pd) with a predetermined pressure value (Pp) and indicating when Pd is greater than Pp thus indicating that the inert gas purifier (**104**) has reached the end of useful life

in which the predetermined pressure value (Pp) is that value corresponding to the pressure difference (Pd) when the

impurity level of the purified gas reaches a critical value above which the purified gas is considered insufficiently pure.

5,150,605

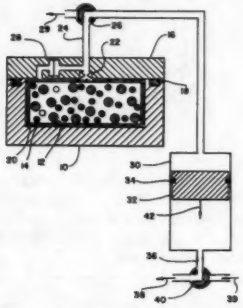
PACKAGE INTEGRITY DETECTION METHOD

Edwin K. Simpson, P.O. Box 266, Hurley, Mo. 65675

Continuation-in-part of Ser. No. 444,530, Dec. 1, 1989, abandoned. This application Mar. 4, 1991, Ser. No. 663,541

Int. Cl.[5] G01M *3/26*

U.S. Cl. 73—49.3 8 Claims



1. A method for determining the integrity of a hermetically sealed package without affecting the physical integrity of the package, comprising the steps of,

providing a pressure source for effecting a movement of air mass,

providing an enclosable vacuum chamber suitable for accommodating a hermetically sealed package therein and being enclosable in sealing tight engagement,

providing an airflow path from said vacuum chamber to said pressure source, said airflow path having valve means interposed therein to isolate said vacuum chamber from said pressure source,

further providing said airflow path with mass flow measuring means for measuring the flow of gas mass between said vacuum chamber and said pressure source,

placing a hermetically sealed package in said vacuum chamber and enclosing said vacuum chamber in fluid tight sealing engagement,

effecting a mass flow of gas as between said vacuum chamber and said pressure source through said airflow path,

activating said mass flow measuring means to measure the rate of mass flow through the said airflow path as between said vacuum chamber and said pressure source as a function of time,

providing a standard reference index of mass flow as a function of time for said vacuum chamber when containing hermetically sealed packages thereon,

and comparing said mass flow rate as a function of time against said standard reference index to determine the integrity of said sealed package as tested against said standard reference index.

5,150,606

ACCELERATION DETECTOR

Satoshi Komurasaki, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jul. 30, 1990, Ser. No. 559,798

Claims priority, application Japan, Aug. 1, 1989, 1-198023

Int. Cl.[5] G01P *15/09*

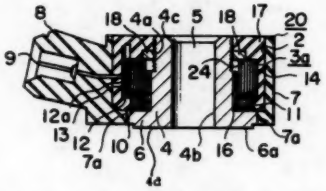
U.S. Cl. 73—35 3 Claims

1. An acceleration detector comprising:

a housing defining a cavity therein and including a substantially cylindrical threaded bushing;

a substantially hollow cylindrical acceleration transducer assembly mounted on said bushing in said cavity and including a piezoelectric element, an inertial weight and an output terminal in a stacked relationship; and

a stop nut thread-engaged on said bushing and having a contact surface at which said stop nut contacts and supports said inertial weight of said transducer assembly for securing said transducer assembly to said bushing, said contact surface maintaining a radial width dimension



smaller than a radial width dimension of said inertial weight to enable said acceleration detector to obtain a substantially constant output over an oscillation frequency range of the acceleration to be detected;

wherein said stop nut has a substantially rectangular cross section, said contact surface is substantially annular, and the radial width dimension of said contact surface is of about 70% of the radial width dimension of said inertial weight.

5,150,607

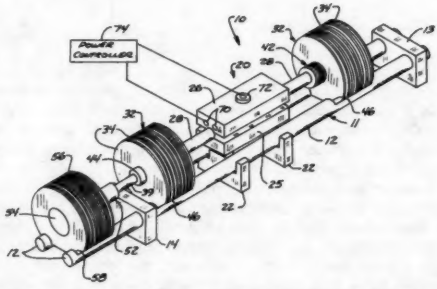
SPINNING DROP TENSIOEXTENSIOMETER

Daniel D. Joseph, 1920 S. First St., Apt. 2302, Minneapolis, Minn. 55454, and Dave A. Hultman, Anoka, Minn., assignors to Daniel D. Joseph, Minneapolis, Minn.

Filed Aug. 8, 1991, Ser. No. 742,291

Int. Cl.[5] G01N *13/02*

U.S. Cl. 73—64.48 19 Claims



1. An apparatus for determining properties related to the relaxation function of polymers of two different densities comprising:

a tubular member defining an internal chamber, and removable means for sealing at least one end of the tubular member;

means for supporting said tubular member for rotation about a longitudinal axis of the tubular member, said means for supporting including precision bearings for rotationally supporting the tubular member at locations spaced from the ends of the tubular member;

heat dissipating means in heat transfer relationship with said precision bearings for conducting heat away from the bearings;

a furnace member mounted on the apparatus and supported

adjacent to substantial portions of said tubular member to provide heat to the contents of said tubular member; and

the furnace having an opening through which the tubular member can be observed for measuring diameters of a quantity of less dense polymer formed into a drop on the interior of said tubular member.

5,150,608

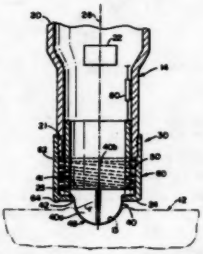
CENTERING DEVICE FOR USE WITH BRINELL HARDNESS-MEASURING PROBE

Giancarlo Mazzoleni, 4 Logger Mill Rd., Horsham, Pa. 19044, and Gordon M. Baker, 5592 Long La., Doylestown, Pa. 18901

Filed Feb. 19, 1991, Ser. No. 657,596

Int. Cl.[5] G01N *3/48*

U.S. Cl. 73—81 **11 Claims**



1. A centering device to improve a Brinell hardness-determining instrument, the instrument having one end configured for placement on a specimen surface to be examined and an opening through the one end providing to optics within the instrument a field of view of the specimen surface on which the one end of the instrument is placed, the centering device comprising:

an alignment member having a central axis and two opposing axial sides, a portion of the alignment member protruding generally concentrically with respect to the central axis from one axial side of the alignment member through the opening to form a centering structure of the alignment member shaped to mate with a generally circular indentation in the specimen surface, a central portion of the alignment member further being configured to freely pass light axially through the alignment member generally around the central axis whereby the field of view of the instrument through the opening is at least substantially unblocked.

5,150,609

ON BOARD COMPUTER FOR A MOTOR VEHICLE

Roland Ebner, Eberdingen, and Dieter Hannig, Weissach, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Aug. 24, 1990, Ser. No. 572,236

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1989, 3927921

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—117.3 **3 Claims**

1. An on-board computer arrangement for a motor vehicle comprising:

signal generators providing input signals which are at least one of: analog signals and digital signals;

a microprocessor coupled to receive said input signals and having stored in a memory thereof a plurality of sets of information which comprise at least one of: programs and data for varying processing of said input signals and display of output information derived from said input signals, a desired set from among said programs and data being freely selectable from said sets of information;

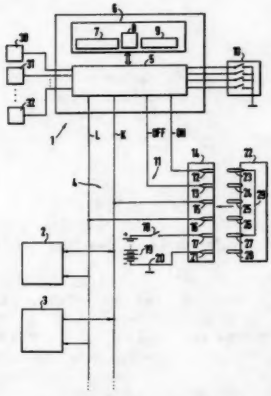
a display system arranged in an instrument cluster within a dashboard of said motor vehicle and coupled to receive and display said output information from said microprocessor;

a diagnostic system for a plurality of control systems installed in said motor vehicle, said control systems having a self monitoring function and nonvolatile storage devices for storing error reports concerning said control systems;

a connecting arrangement coupled to said on-board computer;

diagnostic connector means connectable to said connecting arrangement, for switching said on-board computer arrangement from a computer mode to a diagnostic mode for reading said error reports from said nonvolatile storage devices; and

function switch means for selecting at least display functions of said on-board computer in the computer mode, and for



controlling a diagnostic sequence in the diagnostic mode, said function switch means being operable in said diagnostic mode for selecting desired specific sets from said sets of programs and data and output information, said selection being initiated through the diagnostic connector connected to the connecting arrangement, by continuous actuation of a switching alternative of said function switch means for a predetermined time period;

wherein said function switch means is operable for preselecting sequentially a desired set from among said programs, data and output information, in response to at least one short actuation of a switching alternative thereof; and

wherein said microprocessor is adapted to select a preselected set from among said programs, data and output information, in response to removal of the diagnostic connector from the connecting arrangement.

5,150,610

AUXILIARY STARTER SWITCH WITH ILLUMINATED GUARD

Dean E. Myers, South Solon, Ohio, assignor to MAC Tools, Inc., Washington Court House, Ohio

Filed Apr. 22, 1991, Ser. No. 688,456

Int. Cl.[5] G01M *19/00*

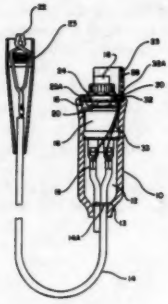
U.S. Cl. 73—118.1 **6 Claims**

1. An auxiliary control switch including a housing and a manually actuatable control button on said switch extending from said housing,

electrical leads connected to said switch and having clips for attachment to a starting motor control to allow temporary auxiliary actuation of the starting motor,

a translucent guard member supported on said housing and extending partially about said control button to limit access thereto,

a warning lamp connected to said leads separately from said switch and supported in optically close-coupled relation



to said guard member, whereby when power is applied to said leads said guard member is illuminated by said lamp.

5,150,611

FLOW SENSOR

Josef Kleinhans, Vaihingen/Enz, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

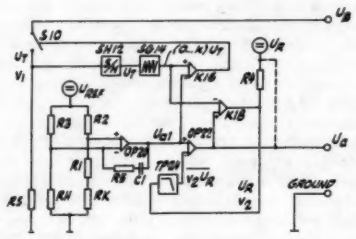
PCT No. PCT/DE88/00776, § 371 Date Oct. 5, 1990, § 102(e) Date Oct. 5, 1990, PCT Pub. No. WO89/07243, PCT Pub. Date Aug. 10, 1989

PCT Filed Dec. 21, 1988, Ser. No. 555,386

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1988, 3803611

Int. Cl.[5] G01F *1/68*

U.S. Cl. 73—204.14 **19 Claims**



1. A circuit for measuring a mass flow rate of air flowing over a probe, comprising:

a first closed loop control circuit which comprises

a resistance bridge circuit having a diagonal voltage and including the probe, and

a switching device for receiving a supply voltage, the switching device being controlled by the diagonal voltage across the resistance bridge circuit to generate voltage pulses based on the supply voltage, the voltage pulses heating the probe;

the first closed loop control circuit generating a first output signal based on the diagonal voltage across the resistance bridge circuit; and

a second closed loop control circuit coupled to the first closed loop control circuit, the second closed loop control circuit receiving the first output signal and a reference voltage, and generating a second output signal based thereon, the second output signal being proportional to the mass flow rate of air flowing over the probe.

5,150,612

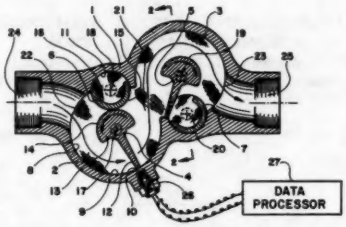
DUAL REVOLVING VANE PUMP-MOTOR-METER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Oct. 16, 1990, Ser. No. 598,161

Int. Cl.[5] G01F *3/08*

U.S. Cl. 73—253 **9 Claims**



1. An apparatus for measuring rate of fluid flow comprising in combination:

a) a body including a pair of cylindrical cavities having closed end walls and connected to one another by an opening, each of said pair of cylindrical cavities having a cylindrical wall with at least one half thereof substantially coinciding with a circular cylindrical surface of a first diameter, and a cylindrical hub member having at least one half of the cylindrical surface thereof substantially coinciding with another circular cylindrical surface of a second diameter less than said first diameter and coaxial to said a circular cylindrical surface, and including a vane radially extending from the cylindrical hub member in a direction opposite to said circular cylindrical surface portion thereof, said cylindrical hub member disposed within the cylindrical cavity rotatably about an axis of rotation coinciding with the common axis of said a and another circular cylindrical surfaces wherein radial edge of the vane describes said a circular cylindrical surface during rotation of the cylindrical hub member; each of said pair of cylindrical cavities further including a recess included in a portion of wall thereof in a parallel relationship to said common axis, and a cylindrical roller rotatably disposed partially in the recess and having a major portion of cylindrical surface thereof substantially coinciding with a circular cylindrical surface tangential to said another circular cylindrical surface and a minor portion of cylindrical surface thereof including an axially disposed cavity radially extending inwardly from said minor portion of the cylindrical surface, said cavity large enough to accommodate said vane extending from the cylindrical hub member; wherein said combinations of the recess and the cylindrical roller respectively included in said pair of cylindrical cavities are respectively disposed on two opposite sides of a plane including the axes of rotation of said cylindrical hub members respectively included in said pair of cylindrical cavities, and each combination of the circular cylindrical portions of cylindrical surfaces of the cylindrical hub member and the cylindrical roller included in each of said pair of cylindrical cavities provides a barrier against fluid flow thereacross;

b) a first port open to one of said pair of cylindrical cavities through a portion of cylindrical wall thereof adjacent to the circular cylindrical portion thereof and located on one side of the cylindrical roller included in the cylindrical cavity opposite to the side including said opening connecting said pair of cylindrical cavities to one another, and a second port open to the other of said pair of cylindrical cavities through a portion of cylindrical wall thereof adjacent to the circular cylindrical portion thereof and located on the other side of the cylindrical roller included in the cylindrical cavity opposite to the side including said opening connecting said pair of cylindrical cavities to one another; and

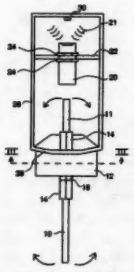
c) rotating motion coupling means coupling rotating motions of the cylindrical hub members and the cylindrical rollers in such a way that the cylindrical hub members respectively included in said pair of cylindrical cavities rotate at the same speed in opposite directions, and the cylindrical hub member and the cylindrical roller included in each of said pair of cylindrical cavities rotate at the same speed in opposite directions wherein the cavity included in the cylindrical roller accommodates the vane extending from the cylindrical hub member during rotation thereof, and that the radial edge of at least one of the two vanes slides on respective circular cylindrical portions of the cylindrical walls of said pair of cylindrical cavities at all instances; wherein fluid entering through said first port and exiting through said second port flows across said plane including the axes of rotation of the cylindrical hub members through a space between the cylindrical hub members respectively included in said pair of cylindrical cavities, and produces rotation of the two vanes and vice versa.

5,150,613

MATERIAL LEVEL SENSING DEVICE

Johnny E. Etheridge, 1744 Old Powhatan Estates Dr., Powhatan, Va. 23139

Filed Apr. 10, 1991, Ser. No. 683,059
Int. Cl.[5] G01K *23/60*; B02C *9/04*
U.S. Cl. 73—291 **11 Claims**



1. A probe for sensing the level of accumulated material in an enclosure, comprising:

a housing;

first means for sensing the level of an accumulated material, including a first portion of the first means arranged within said housing to be displaced from a nominal quiescent point due to the presence of a predetermined level of the accumulated material;

second means located within said housing for sensing the relative proximity of the first portion of the first means to the second means; and

means for transmitting a signal to external circuitry to indicate that the relative proximity of the first portion of the first means to the second means has changed by a predetermined value as an indication that the predetermined level of accumulated material has been reached;

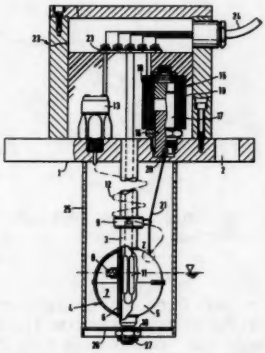
wherein the first means further includes a second portion arranged to cause the first portion to be displaced from the nominal quiescent point when the second portion is contacted by the accumulated material as an indication that the predetermined level of accumulated material has been reached.

5,150,614

LIQUID LEVEL SENSING DEVICE

Manfred Urich, Anton-Bruckner-Strasse 3, D-6390 Usingen, Fed. Rep. of Germany

Filed Jun. 25, 1991, Ser. No. 719,733
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1990, 9007189; Dec. 29, 1990, 4042235
Int. Cl.[5] H01H *5/02*; G01F *23/36*
U.S. Cl. 73—308 **13 Claims**



1. A liquid level sensing device for a liquid tank, with a movably mounted float (4) which includes a permanent magnet (8) and is mounted on a slide tube (3) fabricated of a nonmagnetic material, said slide tube being arranged on a plate (1) in a manner closing an opening of a tank and said device being provided with a switching device (11) which is actuatable in non-contact fashion by magnetic force, the improvement comprising a float (4) movable independently of a liquid level in the tank by a magnetic actuation device (15) into a position in which the switching device is actuated, the actuation device (15) including an armature (16) which is connected to the float (4) by a means (21) providing freedom of movement of the float (4) due to buoyancy and which armature is slidably mounted in a sleeve (17) of nonmagnetic material connected tight with the plate (1) and closed relative to the outside.

5,150,615

LIQUID LEVEL SENSOR

Michael J. Rymut, Cadillac; Stephen R. W. Cooper, Tustin, and John M. Washeleski, Reed City, all of Mich., assignors to Nartron Corporation, Read City, Mich.

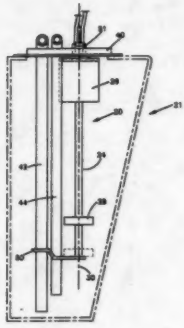
Continuation of Ser. No. 643,536, Jan. 18, 1991, abandoned. This application Aug. 7, 1991, Ser. No. 742,272
Int. Cl.[5] G01D *5/20*; G01F *23/62*
U.S. Cl. 73—313 **13 Claims**

1. A fuel level sensor comprising:

a) an elongated probe adapted for insertion into a fuel container including side by side primary and secondary transformer coils wound around first and second coil forms insulated from contact with fuel in the fuel container by an elongated probe housing;

b) a fuel level float positioned within the fuel container for movement along a travel path as the fuel level changes with fuel consumption; said fuel level float including a coupling material that alters the transformer coupling between the primary and secondary transformer coils of said elongated probe as the fuel level float moves along the travel path; and

c) sensing circuitry for exciting the primary transformer coils with an excitation signal and evaluating a position of



the fuel level float along said travel path from an output signal from the secondary transformer coil.

5,150,616

SEMICONDUCTOR STRAIN SENSOR AND MANUFACTURING METHOD THEREOF

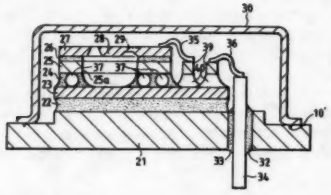
Munenari Kondo, Mie; Masahito Imai, Aichi; Ryoichi Narita, Aichi, and Takushi Maeda, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 31, 1990, Ser. No. 575,526

Claims priority, application Japan, Sep. 21, 1989, 1-245852

Int. Cl.[5] G01P *15/08*

U.S. Cl. 73—517 R 5 Claims



1. A semiconductor accelerometer comprising:

a stem having a front and back surface;

a sensor chip for sensing acceleration and bonded to said front surface of said stem by an adhesive, said adhesive having a thickness of 100 to 200 μm; and

a shell for covering said sensor chip attached to said front surface of said stem by a projection welding technique.

5,150,617

MAGNETOSTRICTIVE RESONANCE EXCITATION

Ricardo B. Schwarz, Los Alamos, N. Mex., and Veli-Tapani Kuokkala, Tampere, Finland, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 29, 1990, Ser. No. 574,404

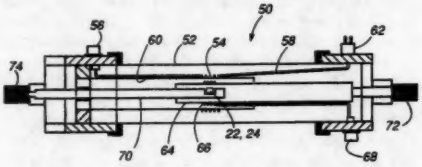
Int. Cl.[5] G01N *29/12*

U.S. Cl. 73—579 10 Claims

1. A resonance excitation system for remotely determining the resonance spectrum of a material sample, where the resonance spectrum is input to the rectangular parallelepiped resonance (RPR) method for determining material elastic moduli, comprising:

a material sample having magnetostrictive properties;

excitation coil means for exciting said sample with an oscillating magnetic field over a frequency range selected to include resonance frequencies within said resonance spectrum of said material sample; and



detection coil means coaxial with said exciting coil means and adapted for axially mounting said material sample therein to detect the response of said material sample to said oscillating magnetic field.

5,150,618

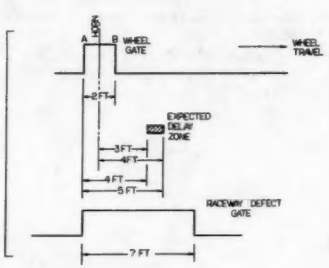
ACOUSTIC BEARING DEFECT DETECTOR

Joseph E. Bambara, North Babylon, N.Y., assignor to Servo Corporation of America, Hicksville, N.Y.

Continuation of Ser. No. 376,890, Jul. 6, 1989, abandoned. This application Dec. 4, 1990, Ser. No. 622,176

Int. Cl.[5] G01N *29/00;* B61K *1/00;* G08B *21/00*

U.S. Cl. 73—660 18 Claims



1. In an apparatus for acoustically scanning bearings of wheels of a train during operation of said train as said train moves through a scanning zone of a track, said apparatus being of the type including means for transducing acoustic vibrations into electrical signals and means for processing said electrical signals to isolate signals of predetermined impact frequencies indicative of particular bearing defects, the improvement comprising wheel presence transducers on said track for generating signals indicative of the beginning and the end of a window during which an isolated signal is expected to occur for a particular bearing of said train and means to determine if an actual isolated signal associated with said particular bearing occurs within said window.

5,150,619

VORTEX FLOWMETERS

John T. Turner, Stockport, England, and Czeslaw O. Popiel, Poznan, Poland, assignors to Schlumberger Industries, Limited, Farnborough, United Kingdom

Filed Jul. 5, 1990, Ser. No. 548,396

Claims priority, application United Kingdom, Jul. 12, 1989, 8915994

Int. Cl.[5] G01F *1/32*

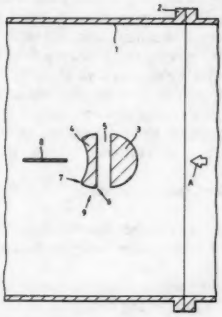
U.S. Cl. 73—861.22 14 Claims

1. A flowmeter for measuring the rate of flow of fluid, the flowmeter comprising:

a flow tube forming a passage for the fluid to be measured:

bluff body disposed in the flow tube for inducing vortices in the flowing fluid, the bluff body comprising a first, up-

stream, cylinder having an arcuate front surface and a planar front surface and a planar or concave rear surface, the two cylinders being separated at their adjacent surfaces by a gap whose width is up to fifty per cent of the diameter of the upstream cylinder; and



a sensing means for measuring the frequency of the vortices shed by the bluff body;

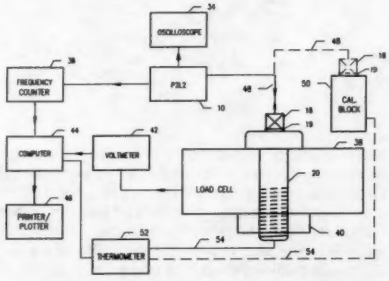
wherein said second cylinder has front edges which are slightly rounded to facilitate fluid flow from the gap.

5,150,620

METHOD OF RECERTIFYING A LOADED BEARING MEMBER

Sidney G. Allison, Poquoson, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 19, 1991, Ser. No. 717,755
Int. Cl.[5] F16B *31/02*
U.S. Cl. 73—862.59 **10 Claims**



1. A method of recertifying a load on a bearing member using various pulsed phase locked loop (P2L2) equipment configurations comprising the following elements of pulsed phase locked loop system, transducer, ultrasonic couplant, and an interconnecting cable between the transducer and the system, each pulsed phase locked loop system having an output frequency comprising the steps of:

(a) performing the following steps on a reference block:

(i) applying an ultrasonic tone burst to the reference block via a first transducer of a first P2L2 equipment configuration to determine the standard frequency F1 of the reference block;

(ii) determining a lock point number s indicative of a selected harmonic resonant frequency of the reference block;

(iii) applying an ultrasonic tone burst to the reference block via a second transducer of a second P2L2 equipment configuration comprising at least one element different from the elements of the first equipment configuratio, to determine the resonant frequency F1a of the reference block at lock point s;

(iv) determining a first dimensionless offset compensation factor Fo1 by the relationship

$$Fo1=((F1-F1a)/F1)1000000;$$

(b) performing the following steps on the unloaded bearing member:

(i) applying an ultrasonic tone burst to the unloaded bearing member using the second equipment configuration to determine the reference frequency F2 of the unloaded bearing member;

(ii) determining a lock point number b indicative of a selected harmonic resonant frequency of the bearing member; and

(iii) compensating the unloaded bearing member frequency F2 for equipment offset errors between the first and second equipment configurations by the relationship $F2c=F2+F2(Fo1)/1000000$; wherein F2c is the compensated frequency;

(c) performing the following steps on the reference block:

(i) applying an ultrasonic tone burst to the reference block via a third equipment configuration having at least one element different from the first and second equipment configuration, to determine a resonant frequency F3 at lock point number s of the reference block; and

(ii) determining a second dimensionless offset compensation factor Fo2 by the relationship $((F1-F3)/F1)1000000$;

(d) performing the following steps on the bearing member after a load is applied thereto:

(i) applying an ultrasonic tone burst to the loaded bearing member via the third equipment configuration to determine a resonant frequency F4 (at lock point number b) of the loaded bearing member; and

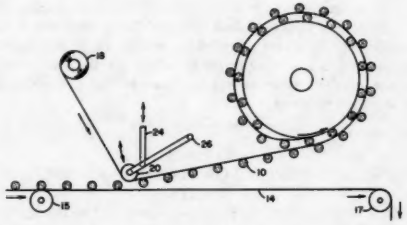
(ii) determining the bolt load equal to $(-1000000)\,Cl(((F2c-F4)/F2c)-Fo2)$, wherein Cl is a bearing member calibration factor correlating the measured frequency shift to the applied load.

5,150,621

APPARATUS FOR COLLECTING SAMPLES OF ARTICLES CONVEYED AT HIGH SPEED IN CONSECUTIVE ORDER

Jack S. Moore, Jr., Blountville; Johnny R. Cox, and Mark L. Williams, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 1, 1990, Ser. No. 607,967
Int. Cl.[5] G01N *1/00*
U.S. Cl. 73—863.91 **6 Claims**



1. Apparatus for intermittently sampling articles comprising

a) a conveyor for advancing articles along a predetermined path,

b) a supply source of adhesive-coated tape adapted to be advanced along a path adjacent to and co-directional with said articles,

c) a drum adapted to have an end of said tape attached thereto and the tape to be wound thereon,

d) an idler roller adapted to bear against the uncoated side of said tape and guide it between said supply source and said drum, said idler roller having a first position guiding said tape out of contact with said articles and a second position guiding said tape into contact with said articles, and

e) means for rotating said drum in a direction and at a speed so as to advance said tape at approximately the same speed as said articles whereby when said idler roller is moved into said second position, articles are picked up by said tape and wound onto said drum.

5,150,622

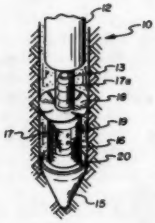
VAPOR PROBE FOR SOIL GAS VAPOR SAMPLER

Arthur R. Vollweiler, 105 Harrison, American Falls, Id. 83211

Filed Feb. 19, 1991, Ser. No. 657,669

Int. Cl.[5] G01N *1/10*

U.S. Cl. 73—864.74 **5 Claims**



1. A soil gas sampling probe for obtaining soil gas samples in the earth, comprising in combination:

a. an elongate cylindrical sampling tube provided with an upper and a lower end and having a multiplicity of gas intake apertures on a surface of the tube;

b. a conically shaped probe tip attached to the lower end of said elongate sampling tube for penetrating the earth as the probe is inserted into the earth to a predetermined depth, said tip having a circumference larger than said cylindrical tube and having a circumferential shelf therein;

c. screening means surrounding the apertures in said cylindrical sampling tube;

d. a flexible disc attached to the upper section of said sampling tube for preventing soil from falling downwardly into a void surrounding said sampling tube and its apertures;

e. flexible tubing attached to the upper end of said sampling tube for transporting gas samples collected through the sampling tube upwardly to the earth's surface; and

f. a removable rigid driving tube surrounding said cylindrical sampling tube and flexible disc for driving said sampling tube into the earth to a predetermined depth; said driving tube being adapted to rest on the circumferential shelf of said conical probe tip while the tip is driven into the earth, and to be removed when the predetermined depth is reached.

5,150,623

INSPECTION DEVICE FOR FLUSH HEAD BOLTS AND RIVETS

Mark A. Woods, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 17, 1990, Ser. No. 554,674

Int. Cl.[5] B21J *15/28*

U.S. Cl. 73—865.8 **8 Claims**

1. A video imaging system for measuring the dimensions of a fastener, comprising:

a pair of orthogonally-oriented cameras;

a feed gate operable to position said fastener at a certain predefined location;

reciprocating chuck member operable to move said fastener from said predefined location into the field of view of said cameras;

a pair of orthogonally-oriented back-lights, one each of said back-lights being directly opposite the field of view of one of said cameras, and oriented so that said fastener is positioned between said camera and said back-light when said fastener is moved into said camera's field of view;

wherein each back-light includes a plurality of light-emitting diodes forming an array of diodes, said array being longer and wider, respectively, than the length and width of any fastener dimensions to be measured, for providing a uniform silhouette of said fastener, without shadows, for each camera; and

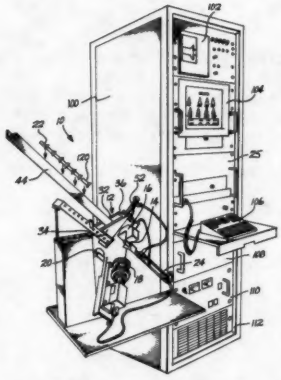
wherein said feed gate includes:

a frame;

a guide rail support member slidably mounted to said frame for vertical movement upwardly or downwardly relative to said frame;

a spring interconnecting said frame and guide rail support member, with said spring being biased to urge said guide rail support member normally upwardly;

a guide rail having an upwardly-opening channel shaped to



hold a plurality of fasteners along a line in substantially head-to-toe fashion, wherein an end of said guide rail is connected to said guide rail support member, and defines a lower part of a feed gate region, said guide rail extending outwardly from one side of said frame;

a guillotine gate that is movable vertically upwardly and downwardly over said end of said guide rail, said guillotine gate defining an upper part of said feed gate region, wherein said guillotine gate is operable to block fastener travel through said gate region when it is in its downwardmost position; and

an adjustment screw having a first threaded portion with a certain pitch, and a second threaded portion with another pitch, said first threaded portion being in threaded engagement with said frame, and drivingly connected to said guide rail support member, for adjusting the vertical position of said end of said guide rail relative to said guillotine gate in response to a turning movement of said screw, said second threaded portion being in driving engagement with said guillotine gate for simultaneously adjusting the downwardmost position of said gate relative to said guide rail as said screw turns, wherein said first and second thread pitches are selected in a manner so that said end of said guide rail and said downwardmost position of said gate approach or move away from each other generally

symmetrically depending on the direction of screw rotation.

5,150,624

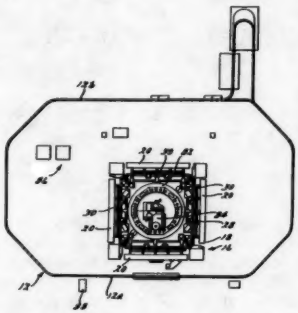
METHOD OF CALIBRATING A ROTARY TOOL UNIT FOR AN ASSEMBLY LINE

James S. Kaczmarek, 21317 Woodhill, Northville, Mich. 48167, and James M. Steimel, 2436 Lassiter, Rochester Hills, Mich. 48309

Continuation-in-part of Ser. No. 649,537, Feb. 1, 1991. This application Mar. 21, 1991, Ser. No. 672,839

Int. Cl.[5] B23Q *41/02;* **B62D** *65/00;* **B65G** *37/00*

U.S. Cl. 73—865.9 **1 Claim**



1. A method of calibrating a rotary tool unit for an assembly line or the like, said rotary unit having a motor having at least a normal rotation speed and a creep speed, a plurality of tool stations, and externally positioned clamping blocks for precisely positioning one of said tool stations at a work station, said method comprising:

measuring a necessary angular deceleration distance for said unit;

determining a desired angular creep distance, including margins of safety;

identifying angular positions for tooling on said unit,

determining the range of said clamping blocks;

empirically determining angular switch points for decelerating and engaging the creep speed of said motor to minimize the time to rotate said unit to precisely position any one of said tooling stations at said work station, and inputting said switch points into programmable controller through a multiple resolver rotation transducer.

5,150,625

GYROSCOPIC DEVICE

Frederick H. Mishler, 38561 Tindle Creek Rd., Willamina, Oreg. 97396

Filed Jan. 7, 1991, Ser. No. 638,337

Int. Cl.[5] A63B *69/00, 11/04*

U.S. Cl. 74—5 R **3 Claims**

1. A gyroscopic device comprising:

a housing,

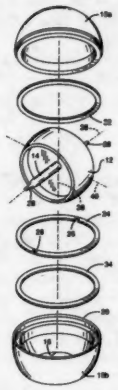
a balance gyroscopic rotor in said housing,

shaft means integrated with said rotor providing a spin axis for said rotor,

support means in said housing receiving opposite ends of said shaft means for rotation of said shaft means and rotor about said spin axis and providing for rotation of said shaft means and rotor relative to said housing about a second axis at right angles to said spin axis,

said support means including continuous circular track means in said housing concentric with said second axis and positioned on opposite sides of and adjacent the ends of said shaft means for rolling contact by end portions of said shaft means when a torque is applied to said housing about a third axis at right angles to both said spin axis and second axis to cause precession of said shaft means and rotor about said second axis,

said track means comprising a circumferential race in said housing with opposed lining portions of a type having a friction surface engagement with said end portions of said shaft means to provide an improved non-slipping, rolling movement of said shaft means and rotor,



and guide ring means in said race having notches receiving end portions of said shaft means and establishing a drive connection between said shaft means and said guide ring means in the rotation of said shaft means and rotor about said second axis, said guide ring means having free sliding movement against said opposed surfaces of said groove.

5,150,626

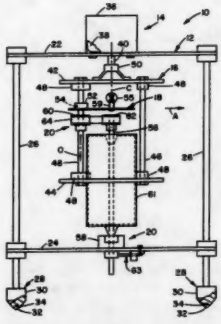
APPARATUS WITH ROTATABLY-DRIVEN ASYMMETRICALLY-ACCELERATED ECCENTRIC MASS FOR GENERATING TRANSLATIONAL FORCE

Thomas L. Navarro, 2914 Benton St., Wheatridge, Colo. 80214, and James D. Isaacson, 535 Pennsylvania St., Denver, Colo. 80203

Continuation-in-part of Ser. No. 675,700, Mar. 27, 1991, abandoned. This application Jul. 22, 1991, Ser. No. 733,294

Int. Cl.[5] F16H *33/20*

U.S. Cl. 74—84 R **12 Claims**



1. A translational force generating apparatus, comprising:

(a) means for generating rotary drive motion;

(b) orbital means attached to said rotary drive motion generating means for undergoing revolution about a central axis

upon operation of said rotary drive means, said orbital means having a portion defining an orbital axis located radially outwardly of and substantially parallel to said central axis;

(c) an orbital mass mounted to said portion of said orbital means for undergoing revolution with said orbital means about said central axis, said orbital mass also mounted to said orbital means portion for undergoing rotation about said orbital axis and for predisposing the center of mass of said orbital mass in an eccentric relation, and at a preset angular position relative, to said orbital axis;

(d) at least one weight;

(e) a resiliently stetchible means mounting said weight on said orbital mass such that said weight can oscillate primarily along a line extending radially relative to said orbital axis so as to define said center of mass of said orbital mass at a variable location relative to said orbital axis; and

(f) rotation-producing coupling means coupled to said orbital mass for producing rotation of said orbital mass in a first direction about said orbital axis at the same frequency as said orbital mass undergoes revolution with said orbital means in a second opposite direction about said central axis so as to maintain the eccentric center of mass of said orbital mass at said preset angular position relative to said orbital axis and thereby produce an asymmetrical acceleration of said orbital mass relative to said central axis so as to impart a substantially translational force to said apparatus.

5,150,627

CONTROL DEVICE FOR A TILTABLE MOUNTING HEAD

Richard A. Lindsay, Suffolk, United Kingdom, assignor to Vinten Group PLC, United Kingdom

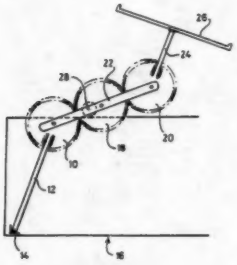
PCT No. PCT/GB90/00158, § 371 Date Jul. 26, 1991, § 102(e) Date Jul. 26, 1991, PCT Pub. No. WO90/09543, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 2, 1990, Ser. No. 730,801

Claims priority, application United Kingdom, Feb. 10, 1989, 8902976

Int. Cl.[5] F16H *37/12*; A47G *29/00*

U.S. Cl. 74—98 **6 Claims**



1. A control device for a tiltable mounting head, comprising a pantographic-type linkage including first and second elements which are movable angularly with respect to one another and means for controlling the relative angular positions of said elements including meshing rotational members to transmit rotation between the first and second elements and means for constraining an intermediate point of the linkage to move along a horizontal path throughout said relative angular movement of the first and second elements of the linkage.

5,150,628

GEARBOX FOR AUTOMOTIVE VEHICLES

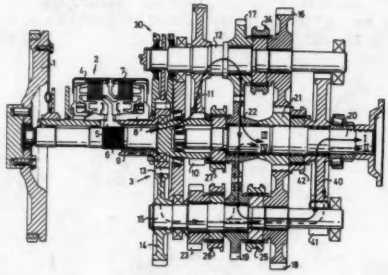
Sverker Alfredsson, Västra Frölunda, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Continuation of Ser. No. 394,413, Aug. 14, 1989, abandoned. This application Dec. 10, 1991, Ser. No. 804,497

Claims priority, application Sweden, Aug. 12, 1988, 8802885

Int. Cl.[5] F16H *3/38*

U.S. Cl. 74—330 **1 Claim**



1. In a gearbox for automotive vehicles, comprising two mutually concentrically journalled and alternately driven input shafts and two lay-shafts which are driven by the input shafts and which carry gear wheels which mesh with gear wheels on an output shaft, wherein at least one gear wheel rotatably mounted on each lay-shaft and capable of being locked on said each shaft by coupling means meshes with a common gear wheel on the output shaft; the improvement wherein said common gear wheel (**22**) on the output shaft (**20**) is journalled for free rotation and can be selectively locked on the shaft with the aid of movable coupling means (**27**) which in another position release said common gear wheel (**22**) and lock said output shaft (**20**) and one of said input shafts (**6**) together for direct drive, and wherein when in its freely rotatable state the common gear wheel is operative to transmit torque from one to the other of said lay-shafts (**12** and **15** respectively).

5,150,629

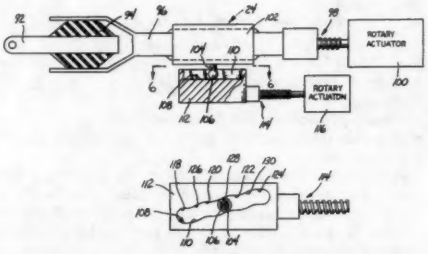
ELECTRO-MECHANICAL POWER CONTROLLER FOR A GEAR SHIFT MECHANISM

Robert L. Morris, Livonia, and Andrew L. Bartos, Clarkston, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 12, 1991, Ser. No. 758,019

Int. Cl.[5] F16H *59/10*; G05G *11/00*

U.S. Cl. 74—337.5 **2 Claims**



1. An electro-mechanical controller in a transmission gear selector having a plurality of forward gear ratios, a reverse gear ratio and a neutral condition, said gear selector being movable linearly for selection of the gear ratios, and rotatably for movement in the neutral condition between gear ratios;

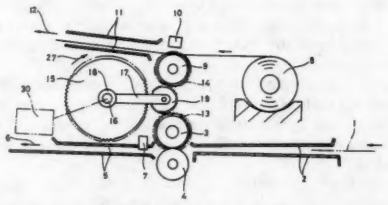
said controller comprising: a first rotary drive means for providing a gear selection input including a first drive translating means for converting rotary motion to linear motion; a selector rod drivingly connected with said first drive translating means for selective movement thereby to provide linear movement thereof for controlled selection of the forward and reverse gear ratios; a second rotary drive means for providing movement in said neutral condition including a cam member comprising a plurality of ramp portions and a dwell portion between adjacent ramp portions; cam follower means operatively connected with said selector rod and drivingly connected with said cam member and cooperating with said ramp portions for enforcing rotary movement of said selector rod to provide movement in said neutral condition and cooperating with said dwell portion for permitting linear movement of said first drive translating means for gear ratio selection; and compliant coupling means operatively connected between said first drive translating means and said selector rod for providing compliance and damping therebetween in response to input motion.

5,150,630

POWER SWITCHING APPARATUS WITH POWER SWITCHING TIMING

Shigeru Kida, Yamatokouriyama, and Katsuyuki Sakai, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 21, 1991, Ser. No. 703,670
Claims priority, application Japan, May 23, 1990, 2-134311
Int. Cl.[5] F16H *3/34*
U.S. Cl. 74—354 **12 Claims**



1. A power switching apparatus, comprising:

a sun gear which can be driven to rotate in a first direction and a second direction which is opposite to said first direction;

an arm having a first and second end, the first end attached to the rotating axis of the sun gear by means for allowing said arm to swing freely relative to the rotating axis of said sun gear;

a transfer gear pivotally provided at said second end of said arm for engaging with said sun gear;

a pair of driven gear disposed a prescribed distance apart from each other in the circumferential direction of said sun gear so that each of said driven gears can engage with said planetary gear independently; and

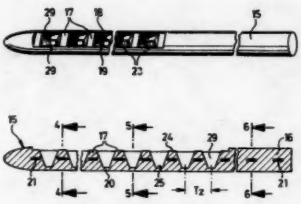
control means for controlling the position of said transfer gear so as to engage said transfer gear with one of said driven gears, before the initiation of the rotation of said sun gear, wherein said transfer gear moves by its own weight to engage with one of said driven gears when said sun gear is not rotated.

5,150,631

FLEXIBLE THERMOPLASTIC RACK BAR

Manfred Faerber, Wielenbach; Otto Wienchol, Pullach, and Bernd Schleicher, Munich, all of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Stockdorf, Fed. Rep. of Germany

Filed Sep. 13, 1991, Ser. No. 759,666
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1990, 4029011
Int. Cl.[5] F16H *29/20*; F16C *1/20*
U.S. Cl. 74—422 **20 Claims**



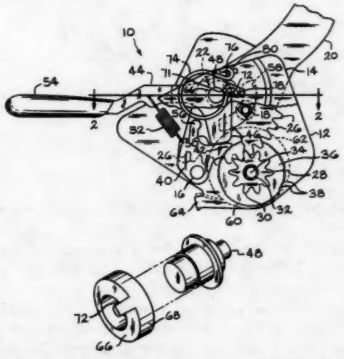
1. A flexible thermoplastic toothed rack bar for meshing with a gear wheel, comprising an elongated body . of a plastic material, said body being formed with a series of teeth that are supported by a pull-resistant reinforcement that is embedded in the body substantially parallel to a pitch line of the rack bar; wherein the teeth are connected at each lateral side of the rack bar; and wherein the reinforcement is confined to a cross-sectional area of the rack bar which lies heightwise between a head and a root of said teeth.

5,150,632

SELF ADJUSTING ECCENTRIC PIVOT MECHANISM

Richard A. Hein, Rochester, Mich., assignor to Hoover Universal, Inc., Plymouth, Mich.

Filed Jun. 27, 1991, Ser. No. 722,250
Int. Cl.[5] A47C *1/026*
U.S. Cl. 74—530 **7 Claims**



4. Recliner mechanism for a seat assembly comprising:

support means;

a seat back arm pivotally mounted to said support means about a first pivot, said seat back arm forming a sector gear portion along a peripheral portion of said seat back arm about said first pivot;

a pinion gear pivotally mounted to said support means about a second pivot, the teeth of said pinion gear meshing with the teeth of said sector gear portion of said seat back support arm;

means for locking said pinion gear to prevent rotation of said pinion gear about said second pivot whereby said seat back support arm is held in a fixed position about said first pivot, said first pivot including a pivot pin fixed to said support means defining a first axis and an eccentric member rotatably mounted on said pivot pin forming an eccentric shoulder having a second axis about which said support arm is rotated; and

bias means for rotating said eccentric member in a direction to urge said second axis toward second pivot whereby said sector gear portion is urged against said pinion gear to eliminate backlash between the teeth of said sector and pinion gears.

5,150,633

SHIFTING ARRANGEMENT FOR A MOTOR VEHICLE TRANSMISSION

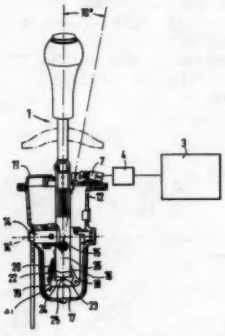
Klaus Hillgärtner, Wimsheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Sep. 9, 1991, Ser. No. 756,784

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1990, 4029330

Int. Cl.[5] B60K *20/00*; G05G *5/06*

U.S. Cl. 74—475 **11 Claims**



1. A shifting arrangement for a motor vehicle transmission, comprising:

a shift control housing having a first shifting channel, a second shifting channel parallel to the first shifting channel, and a transverse channel;

a selector lever arranged in a cardan joint and which can be swivelled in the first shifting channel for preselecting transmission gears and, via the transverse channel, can be changed over into the second shifting channel;

a joint hub coupled to the selector lever;

a resilient detent link and a detent member that holds the selector lever, in both end positions of the change-over movement, in the detent link; and

a tension spring coupled to the detent link;

wherein said detent link includes a detent lever which, on a first side, is rotatably disposed in the joint hub, and on a second side, is braced by the tension spring against the detent member.

5,150,634

CONTROL ARRANGEMENT FOR AUTOMATIC AUTOMOTIVE TRANSMISSION

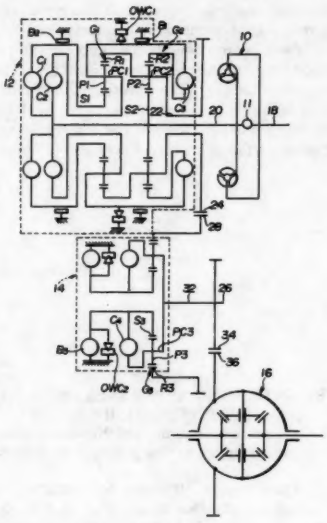
Tatsuo Wakahara, Kawasaki, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 18, 1991, Ser. No. 792,526

Claims priority, application Japan, Nov. 21, 1990, 2-316809

Int. Cl.[5] F16H *61/16*

U.S. Cl. 74—866 **4 Claims**



1. In a transmission having an input shaft which is operatively connected with a prime mover, and an output shaft

a first gear train capable of selectively producing a plurality of gear ratios, said first gear train being operatively connected with the transmission input shaft and having an output shaft;

a second gear train which is operatively connected with the output shaft of the first gear train and which is capable of producing a plurality of gear ratios, the second gear train being operatively connected with the transmission output shaft;

a one-way clutch which is included in one of said first and second gear trains and which is subject to load when the transmission output shaft is driven to rotate by the torque applied to the transmission input shaft;

load sensor means for determining the load under which the prime mover is operating;

means for determining the rotational speed of the transmission input shaft;

means for determining the rotational speed of the transmission output shaft;

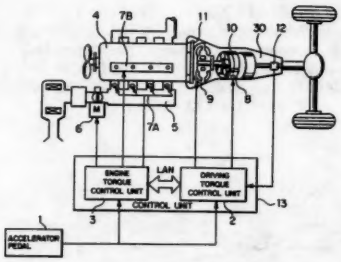
transmission control means responsive to the engine load sensor means, the transmission input shaft rotational speed sensing means and the transmission output shaft rotational speed sensing means, said transmission control means including means for determining if an upshift is required and for, in the event that the prime mover is operating under minimal load and an upshift is indicated as being necessary, inhibiting the upshift until such time as the rotational speed of the transmission output shaft exceeds the product of the input rotational speed and the gear ratio which the transmission is currently conditioned to produce.

5,150,635

METHOD AND APPARTAUS FOR CONTROLLING DRIVING POWER OF MOTOR VEHICLE

Toshimichi Minowa, Ibaraki, and Yoshishige Ohyama, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 17, 1991, Ser. No. 686,527
Claims priority, application Japan, Apr. 18, 1990, 2-100321
Int. Cl.[5] B60K *41/04*
U.S. Cl. 74—866 35 Claims



1. An apparatus for controlling driving power of a vehicle having an engine, a transmission, means for detecting vehicle speed and means for detecting the stroke of an accelerator pedal, comprising:

first means for obtaining a desired driving torque of a vehicle required by a driver on the basis of a detected value of vehicle speed and a detected value of accelerator pedal stroke; and

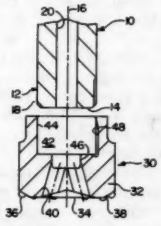
second means responsive to said first means for controlling the transmission gear ratio of said transmission and engine torque so as to drive an engine substantially in a smallest fuel-cost ratio region on the basis of the obtained desired driving torque.

5,150,636

ROCK DRILL BIT AND METHOD OF MAKING SAME

Thomas E. Hill, Mercersburg, Pa., assignor to Loudon Enterprises, Inc., Mercersburg, Pa.

Filed Jun. 28, 1991, Ser. No. 721,767
Int. Cl.[5] B21K *5/02*
U.S. Cl. 76—108.2 19 Claims



1. A method of making a rock drill bit having a shank and a replaceable cutting head, comprising steps of

producing a steel shank having a tip with an outer surface having a predetermined cross-sectional shape,

producing a steel head having a working face at one end and a recess at the other end with a cross-section corresponding in shape to that of said shank tip, and having a size at least in the range of 0.012% to 0.38% less than that of said shank tip when the components are at the same temperature,

cooling said shank with a cryogenic fluid to reduce its size to less than that of said recess,

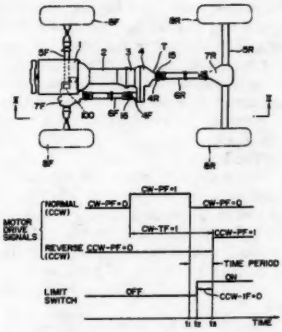
installing said head on said shank tip, and permitting the components to return to ambient temperature, to establish a shrink fit between the head and the shank.

5,150,637

TRANSFER CASE SHIFTING APPARATUS FOR FOUR WHEEL DRIVE VEHICLE

Hiroshi Ninomiya, and Satoshi Fujikawa, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation-in-part of Ser. No. 438,176, Nov. 20, 1989, abandoned. This application Feb. 27, 1991, Ser. No. 663,053
Claims priority, application Japan, Nov. 18, 1988, 63-290186
Int. Cl.[5] F16H *59/02;* B60K *17/35*
U.S. Cl. 74—335 4 Claims



1. An apparatus for shifting a transfer gear assembly of a vehicle, having a center differential, between at least two wheel drive and four wheel drive conditions, the apparatus comprising:

shift means driven by a reversible motor for moving between at least two positions and shifting said transfer gear assembly between said at least two wheel drive and four wheel drive conditions;

a drive condition sensor for providing position signals which direct said shift means to move to a desired one of said at least two positions and shift said transfer gear assembly into a desired drive condition of said at least two wheel drive and four wheel drive conditions;

control means for providing a drive signal which continuously causes said reversible motor to rotate in one direction of rotation according to said position signals so as to move said shift means to said desired one of said at least two positions; and

over load detecting means for being actuated when loads larger than a set load are on said reversible motor, said over load detecting means providing a motor stop signal for stopping said reversible motor when said over load detecting means is actuated;

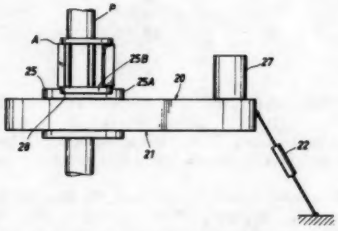
wherein said control means includes a timer for counting down a set time period after a disappearance of said drive signal from said control means and forbids said reversible motor to rotate in another direction of rotation while said time counting means counts down said set time period.

5,150,638

POWER TONG FOR MAKING UP OR BREAKING OUT THREADED JOINTS OF PIPE

Dennis J. Penisson, Raceland, La., assignor to Bilco Tools, Inc., Houma, La.

Filed Feb. 4, 1992, Ser. No. 830,683
Int. Cl.[5] B25B *21/00*
U.S. Cl. 81—57.17 10 Claims



1. A power tong for making up or breaking out threaded joints of pipe, comprising

a housing adapted to be held against rotation,

a head rotatably mounted on the housing,

each of the housing and head having slots adapted to be aligned with one another to receive a joint of the pipe along the axis of rotation of the head,

flexible band means having a length adapted to surround a major circumferential portion of the pipe joint,

an arm mounting a first portion of the band means on the head for swinging between a first position adjacent one side of the pipe joint and a second position to one side of the slot in the head,

means for locking the arm in said first position, and

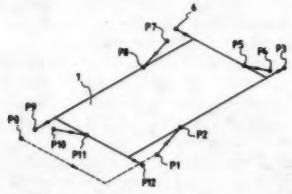
fluid operated means on the head for moving a second portion of the band means in a direction tangentially of the one side of the pipe joint and toward said first portion of the band means so that the pipe joint is tightly gripped by the band means for rotation with the head.

5,150,639

METHOD OF CUTTING THIN FILM OUT AND DEVICE FOR PRACTICING SAME

Fumio Hamamura, Kanagawa, and Katsuyoshi Watanabe, Yamaguchi, both of Japan, assignors to Somar Corporation and Hitachi Techno Engineering Co., Ltd., both of Tokyo, Japan

Filed Oct. 7, 1991, Ser. No. 772,301
Claims priority, application Japan, Dec. 20, 1990, 2-404310
Int. Cl.[5] B26D *1/45*
U.S. Cl. 83—39 9 Claims



5. A device by which a first thin continuous film for conveying a base plate put on said first film and a second thin continuous film stuck to a main surface of said plate are cut out along the contour of said plate, comprising:

a cut-out table on which said plate put on the first film and stuck with the second film is removably placed;

means for initially setting a cutter in a position between both the ends of and offset from one edge of said plate, moving said cutter from said position to said edge to put said cutter into contact therewith, and moving said cutter along said edge;

means for performing the movement of said cutter along all the edges of said plate sequentially in first directions; and

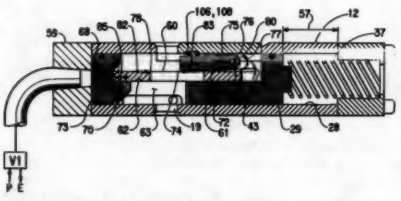
means for moving said cutter along all said edges in directions reverse to the movement of said cutter in the first directions.

5,150,640

HIGH-SPEED CUTTER FOR YARNS

Tadeusz E. Schnitzer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 461,470, Dec. 28, 1989, Pat. No. 5,033,345. This application Apr. 23, 1991, Ser. No. 689,586
Int. Cl.[5] B26D *1/08*
U.S. Cl. 83—583 12 Claims



2. A yarn cutter, comprising:

a) a cutter body containing a bore therethrough with a body notch extending transversely from one side of the cutter body through the bore to a notch bottom, the body notch adapted to receive a yarn;

b) a cutting means for cutting the yarn received in the body notch, comprising:

i) a piston slideably fitted into the bore and adapted to move from a first end of the bore to a second end, the piston having a notch extending transversely from one side of the piston to a notch bottom, which is aligned with the bottom of the body notch,

ii) a cutting element having a notch, the cutting element affixed to the piston, having a planar surface and a cutting edge at one side of the element notch, the edge positioned adjacent to a side of the piston notch adjacent to the first end of the bore, wherein the surface is continuously parallel to the longitudinal axis of the bore, extends from one side of the piston notch to the other, and is supported on both side of the piston notch, and

iii) a cutting element affixed to the cutter body, having a straight line cutting edge that is in contact with the surface of the notched cutting element, thereby creating a line-to-surface contact between the cutting elements throughout the piston travel from the first end to the second end of the bore; and

c) a rigid stop means continuously engaging a surface on the cutter body and a surface on the piston throughout the piston travel, thereby preventing rotation of the piston.

5,150,641

APPARATUS FOR SLICING A WORKPIECE

Peter G. Werner, Pestalozzistrasse 38, 5014 Kerpen, Fed. Rep. of Germany

Filed Sep. 14, 1990, Ser. No. 583,391
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1989, 3931837
Int. Cl.[5] B26D *1/10*
U.S. Cl. 83—647 4 Claims

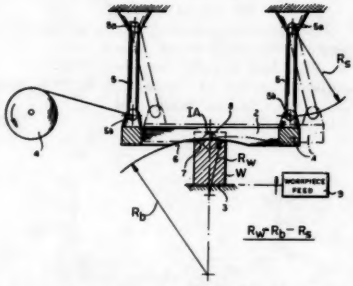
1. In an apparatus for slicing a workpiece, the apparatus comprising:

a support member carrying the workpiece to be sliced;

an elongated cutting blade member juxtaposed with the workpiece and having an arcuate cutting edge in the shape of a circular arc with a blade-edge radius R_b in contact with the workpiece;

a pair of links forming a parallelogrammatic linkage carrying one of the members for oscillating the one member relative to the other of the members parallel to the elongated blade member with an oscillation radius R_S equal to an effective link length; and

drive means coupled with the linkage for oscillating same and including means for displacing the one member toward the other member and causing the blade to cut into



the workpiece therein and form therein a kerf having a floor with a circularly arcuate contour having a curvature radius R_W extending between two kerf ends, the improvement wherein

the effective link length and blade are constructed such that the blade-edge radius R_b is greater than the oscillation radius R_S;

the difference between the blade-edge radius R_b and the oscillation radius R_S is equal to the curvature radius R_W of the kerf and is such that the blade edge contacts the kerf in quasi-point contact along its entire length between the kerf ends as the linkage is oscillated.

5,150,642

DEVICE FOR APPLYING TORQUE TO A TUBULAR MEMBER

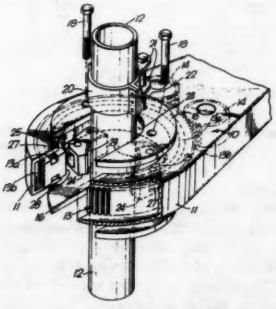
Victor Moody, Lowestoft, and Andrew Jenner, St. Olaves, both of Great Britain, assignors to Frank's International Ltd., Norfolk, England

Filed Sep. 5, 1991, Ser. No. 755,158

Claims priority, application United Kingdom, Sep. 6, 1990, 9019416

Int. Cl.[5] B25B *17/00*

U.S. Cl. 81—57.2 **4 Claims**



1. A device for applying torque to a tubular member, comprising a primary support for disposition about the tubular member, a drive member mounted on the support for rotation relative thereto about the axis of the tubular member, a secondary support disposed coaxially with the drive member, the drive member being capable of rotation relative to the secondary support, gripping elements pivotally mounted on the secondary support for movement into and out of gripping engagement with the tubular member, cam means and follower means one of which means is carried by the drive member and the other of which means is carried by the gripper elements, whereby the drive member operates the gripping elements through the cam and follower means so that rotation of the drive member relative to the secondary support in one direction actuates pivotal movement of the gripping elements into said gripping engagement with the tubular member and in the opposite direction causes the gripping elements to release their grip on the tubular member, and releasable means whereby the secondary support can be rotationally fixed relative to the tubular member.

5,150,643

RECIPROCATING ACTUATOR

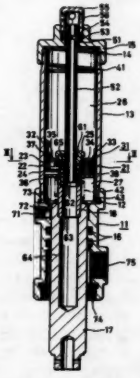
Seiji Saita, Yokohama, Japan, assignor to Kabushiki Kaisha Yamada Corp., Tokyo, Japan

Filed Oct. 22, 1990, Ser. No. 602,119

Claims priority, application Japan, Nov. 16, 1989, 1-297945

Int. Cl.[5] F01L *21/04, 25/02*

U.S. Cl. 91—229 **1 Claim**



1. A reciprocating actuator comprising:

a cylinder;

a single-rod piston slid ably fitted in said cylinder;

said single-rod piston dividing said cylinder into first and second working fluid chambers;

a plunger connected to said single-rod piston;

means for permitting said single-rod piston and said plunger to move in a reciprocating motion within said cylinder;

a directional control valve mechanism;

said directional control valve mechanism including means, effective at ends of said reciprocating motion, for switching the supplying anal discharging of working fluid into and from said first and second working fluid chambers;

a working fluid discharge pipe extending from one end through an entire length of said cylinder;

means for sealing said working fluid discharge pipe to said single-rod piston;

at least one inner hole running the length of said working fluid discharge pipe;

and said directional control valve mechanism including means for releasing said working fluid from said first working fluid chamber into said at least one inner hole

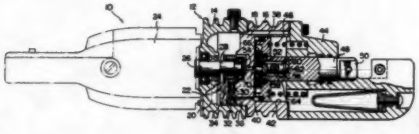
during travel of said single-rod piston in one direction of its reciprocating motion;
said directional control valve includes:
an upper valve plate;
a washer below said upper valve plate;
at least one working fluid discharge hole in said washer;
a valve seat in said washer;
at least one ventilation hole in said washer;
at least one coupler passing slid ably through said washer;
said at least one working fluid discharge hole communicating with said at least one inner hole, thereby allowing working fluid to enter said at least one inner hole and exhaust through said at least one inner hole;
said at least one ventilation hole communicating, between said first and second working fluid chambers;
means for closing said at least one working fluid discharge hole by said upper valve plate at a first extreme of motion;
a lower valve plate; and
means for closing said at least one ventilation hole by said lower plate at a second extreme of motion.

5,150,644

RELEASE VALVE MECHANISM IN A FLUID OPERATED LINEAR ACTUATOR FOR A PORTABLE CUTTER OR THE LIKE

Kiyoshi Kimura, Fujisawa, Japan, assignor to Kabushiku Kasisha Ogura, Kanagawa, Japan

Filed Apr. 10, 1991, Ser. No. 683,074
Claims priority, application Japan, Apr. 17, 1990, 2-40945; May 21, 1990, 2-52841
Int. Cl.[5] F15B *15/22*
U.S. Cl. 91—395 **9 Claims**



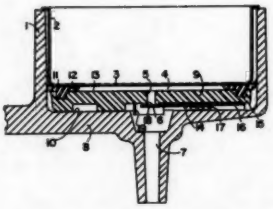
1. A fluid operated linear actuator comprising:
(a) a housing having a pair of opposite ends;
(b) a piston slidably received in the housing and defining therein a fluid chamber between the piston and one end of the housing, the piton having formed therein a hollow and a hole communicating the hollow with the fluid chamber;
(c) there being a fluid intake port and a fluid discharge port defined in the housing for the intake of a fluid under pressure into the fluid chamber and for the discharge of the fluid therefrom, at least the fluid discharge port being formed in said one end of the housing;
(d) release valve means disposed in the fluid chamber and extending through the hole in the piston and into the hollow in the piston so as to permit the movement of the piston relative to the release valve means, the release valve means having a valve head which is disposed in the hollow in the piston and which is movable relative to the housing for opening and closing the fluid discharge port wherein the release valve means further comprises:
a valve stem extending through the hole in the piston and having the valve head formed on one end thereof, the valve stem being movable with the valve head into and out of abutment against said one end of the housing for opening and closing the fluid discharge port; and
resilient means acting between the housing and the valve stem for biasing the latter in a direction for opening the fluid discharge port;
(e) the hole in the piston being formed to include at least one fluid passageway for the admission of the pressurized fluid from the fluid chamber into the hollow in the piston at least during the travel of the piston away from said one end of the housing under the fluid pressure, with the release valve means held closing the fluid discharge port under the fluid pressure acting on the valve head during such piston travel, the maximum diameter of the hole inclusive of the fluid passageway being less than the diameter of the valve head of the release valve means whereby the pressurized fluid being admitted into the hollow in the piston through the fluid passageway acts on the valve head at or toward the end of the travel of the piston away from said one end of the housing thereby causing the release valve means to open the fluid discharge port.

5,150,645

FILTER HOLDER FOR A COFFEE MACHINE OF THE "ESPRESSO" TYPE

Patrice J. C. Schiettecatte, Alencon, France, assignor to Moulinex (Societe Anonyme), Bagnolet, France

Filed May 29, 1991, Ser. No. 707,004
Claims priority, application France, May 30, 1990, 90 06734
Int. Cl.[5] A23F *5/24*
U.S. Cl. 99—295 **4 Claims**



1. Filter holder adapted to be mounted on a coffee machine of the "espresso" type, said filter holder comprising a receptacle (1) adapted to receive a filter (2) in the form of a cup which is intended to contain an amount of ground coffee and whose bottom (3) is perforated, and an infusion collection chamber (4) situated beneath the bottom (3) of said filter and comprising a bottom wall (9, 8') which has an infusion outlet channel (5) therein, said channel (5) having an opening (6) communicating with a distributing funnel (7) permitting coffee to flow out from the receptacle, said filter holder further comprising a device for making foam comprising a flexible blade (14) disposed transversely across the opening (6) of the channel (5), one end (16) of which is anchored on a base (17) integrated with the bottom wall (9, 8') of the chamber (4), and the other end (18) of which is free and is applied with a predetermined spring force against said opening (6) so as to produce a laminar infusion jet only when the pressure in the chamber (4) is greater than the force with which the free end (18) of the blade is applied against the opening (6), and a partition (19) arranged around the blade (14) and extending downwardly such that the infusion jet becomes atomized on the partition thereby forming the foam.

5,150,646

STACKING AND BUNDLING FORM FOR NEWSPAPERS TO BE RECYCLED

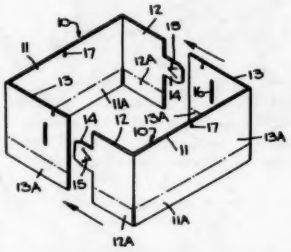
John Lonczak, 14 Park Pl., Newburgh, N.Y. 12550

Filed Feb. 11, 1991, Ser. No. 653,620
Int. Cl.[5] B65B *13/18*
U.S. Cl. 106—34 **5 Claims**

1. A rectangular form having an open top adapted to facilitate a neat stacking and bundling of newspapers to be recycled, said form having rectangular dimensions substantially the same as those of a standard folded newspaper and of an unfolded tabloid, said form being composed of a pair of complementary sections, each section comprising:
(a) a broad side wall;

(b) a minor end wall at right angles to one end of the side wall and provided with a projecting locking tongue; and

(c) a major end wall at right angles to the other end of the side wall and having a slot therein adjacent its edge to receive the locking tongue of the other section, said major end wall being wider than said minor end wall, said sections being assembled in opposed relation with the major and minor walls partially overlapped, to an extent permitting the tongue of each section to be inserted in the slot of the other section whereby the form has a width determined by the combined dimensions of the partially overlapped major and minor end walls, said side wall and said



end walls each being provided with a fold-in, relatively narrow bottom flap, the flaps of the sections overlapping at the corners of the form to maintain its rectangular shape without closing the bottom of the form, the side walls of the sections including upper edges provided with keyhole slots to retain ends of a first cord which extends transversely along the bottom of the form, the major end walls of the sections including upper edges provided with keyhole slots to retain ends of a second cord which extends longitudinally along the bottom of the form, whereby when the form is loaded with a pile of papers which overlie the cords, the ends of the cords may then by removed from said slots and be tied to bundle the pile.

5,150,647

APPARATUS FOR SEVERING STACKS OF SHEETS

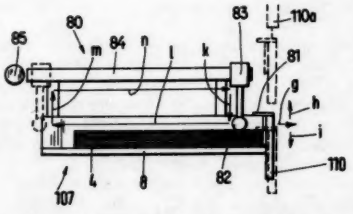
Wolfgang Mohr, Hundshager Weg 42, D-6238 Hofheim, Fed. Rep. of Germany

Continuation of Ser. No. 38,886, Apr. 15, 1987, abandoned. This application Oct. 26, 1989, Ser. No. 427,979

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1986, 3613315

Int. Cl.[5] B30B *9/20*

U.S. Cl. 100—90 **1 Claim**



1. Apparatus for manipulating stacks of paper sheets at a treating station where the stacks are subdivided into smaller stacks and a transfer station at which the stacks are positioned for transfer to the treating station, comprising a support including a working section at the treating station and a mobile section; guide means defining a path for movement of the mobile section between the transfer station and the treating station so that the mobile section can deliver stacks to the treating station; means for manipulating stacks at the treating station; means defining a loading station adjacent said transfer station and arranged to support stacks prior to delivery to said transfer station; and means for expelling air from between the sheets of stacks at said loading station, including an elongated hold-down device for stacks on the mobile section, an air expelling element including an elongated roller which is parallel to said hold-down device, and means for urging said air expelling element against the stacks on the mobile section from above and for moving said element along the mobile section.

5,150,648

METHOD AND APPARATUS FOR DETECTING PRINT-TERMINATION IN LINE PRINTER

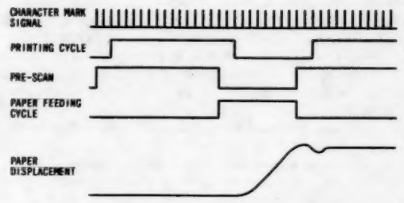
Kenji Okada, and Tsukasa Ogawa, both of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1990, Ser. No. 540,235

Claims priority, application Japan, Jun. 23, 1989, 1-161782

Int. Cl.[5] B41J *1/20*

U.S. Cl. 101—93.14 **18 Claims**



1. In a line printer comprising: a character carrier adapted to continuously move along a print line; a plurality of print hammers arranged side by side along the print line so as to be in opposition to said character carrier; a code generator for storing character codes according to the arrangement of characters carried on said character carrier; a print line buffer for storing print data; a comparing means for comparing a character code supplied from said code generator with a print datum supplied from said print line buffer and for generating a print hammer drive signal when the type element code and the print datum accord with each other; and a pre-scanning flag for storing information indicating presence/absence of print data for every print hammer column when the print data is stored in said print line buffer;

a method of detecting termination of printing comprising the steps of:

performing anticipatory comparison to judge whether a character X columns after a character currently opposing one of said print hammer columns accords with the print data or not, when comparison between the character currently opposing to said one print hammer column and the print data is made by said comparing means;

rewriting contents of a corresponding column of said pre-scanning flag to indicate "absence of print data" when the step of anticipatory comparison determines that the character X columns after said character currently opposing to said one print hammer column accords with the print data; and

recognizing termination of printing when all the columns of said pre-scanning flag indicate "absence of print data".

5,150,649

INK POT DEVICE FOR PRINTING MACHINE

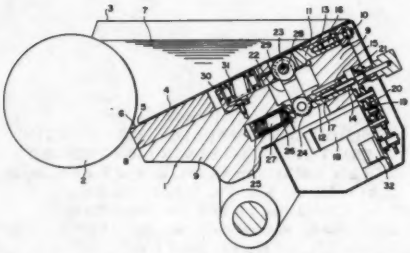
Tuneo Kumaki; Toshikatu Nagase, both of Omiya, and Yasuhisa Shichijo, Saitama, all of Japan, assignors to JPE Co., Ltd., Saita Ma Ken, Japan

Continuation of Ser. No. 363,281, Jun. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 92,237, Sep. 2, 1987, abandoned. This application Jan. 11, 1991, Ser. No. 639,752

Claims priority, application Japan, Sep. 11, 1986, 61-214259; Sep. 11, 1986, 61-214261; Sep. 12, 1986, 61-140481[U]; Sep. 12, 1986, 61-269333; Mar. 26, 1987, 62-44936[U]

Int. Cl.[5] B41F *31/04, 31/06, 27/06*

U.S. Cl. 101—365 **9 Claims**



1. In an ink pot device of the divided ink key blades type comprising an ink gate roller having a peripheral face, a body, a plurality of ink keys, each ink key of said ink keys having a front end adjacent to said peripheral face and a rear end; links, each link of said links being associated with a respective ink key and having one end which is pivotally supported by a pivot shaft behind said respective said ink key; individual eccentric means associated with and connected to a respective said link, each eccentric means being fixedly mounted on the pivot shaft and moveably together with said respective link and being in constant contact with the rear end of a respective said ink key, and means for swinging each respective link by acting on the other end thereof so that, by swinging each respective link to shift the eccentric means, the distance between the front end of each respective ink key and the peripheral face of the ink gate roller may be changed to adjust the amount of ink supplied onto the ink gate roller; the improvements which comprises:

a means for moveably holding the pivot shaft of each respective link in the moving direction of each respective ink key, and

a means for shifting the holding means, so that each respective ink key may be shifted independently of the means for swinging each respective link, thereby changing the distance between the front end of each respective ink key and the peripheral face of the ink gate roller.

5,150,650

CLEANER FOR ROTARY BODIES SUCH AS BLANKET CYLINDER, IMPRESSION CYLINDER, INK SUPPLY ROLLERS AND THE LIKE

Yoshichika Murakami, 17-4, Sugao 5-Chome, Miyamae-ku, Kawasaki-shi, Kanagawa-ken, Japan

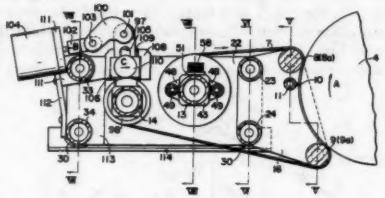
Filed Aug. 31, 1990, Ser. No. 576,018

Claims priority, application Japan, Sep. 1, 1989, 1-224560; Apr. 6, 1990, 2-91778

Int. Cl.[5] B41F *35/00*

U.S. Cl. 101—425 **26 Claims**

1. A cleaner for cleaning a rotary body such as a blanket cylinder, impression cylinder, ink supply rollers and the like, comprising: a cleaning cloth having a portion stretched between two supporting points so that said portion is in full surface contact with and may be pressed against a peripheral surface of a rotary body to be cleaned; means for supplying a washing material onto the back of the cleaning cloth; means for advancing the cleaning cloth in a direction opposite to the rotation of the peripheral surface of the rotary body, the means for advancing comprising a supply roll for supplying the cleaning cloth between the supporting points and a take-up roll for taking up the cleaning cloth from the supporting points; bearings for supporting both ends of the supply roll; and braking means for braking the supply roll comprising a brake shoe



disposed in at least one of the bearings and means for controlling the brake force of each brake shoe to thereby control the stretched force of the cleaning cloth; wherein the bearings include an opening for attaching and detaching the supply roll and a cover rotatably connected to the brake shoe to open and shut the opening for attachment and detachment.

5,150,651

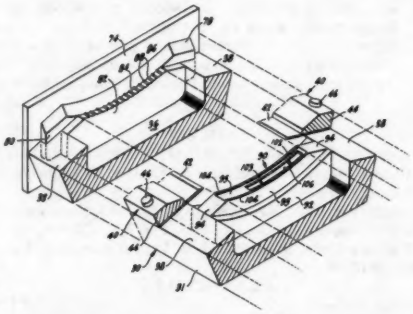
DOCTOR-BLADE ASSEMBLY FOR FLEXOGRAPHIC PRESS

Carlos R. Flores, 931 Craven Dr., Suisun City, Calif. 94585

Filed Jun. 10, 1991, Ser. No. 712,570

Int. Cl.[5] B41F *31/06*

U.S. Cl. 101—207 **18 Claims**



1. An improved doctor-blade assembly for a flexographic press having an anilox ink metering roll, the assembly comprising:

an ink fountain having an elongated tray with a base, sides and ends, forming an interior ink chamber, the sides each having a sloped mounting lip with a doctor blade and clamp means for clamping the doctor blade along the lip wherein the doctor blades are oppositely arranged on the lips, each blade having a projecting portion defining in part the formed ink chamber; and,

actuator means for positioning the ink fountain in juxtaposition with the anilox roll, wherein the ends of the ink fountain tray have end plates and improved end seals fabricated from an elastomeric material, wherein the ink tray and clamped doctor blades form a cross section of the ink chamber with an irregular configuration, the end seals having a unitary construction with a contoured central portion, and a contoured flared portion,

wherein the contoured central portion of the end seals projects into the ink chamber and under slight compression has a configuration conforming to the irregular cross

section of the ink chamber, the central portion including an arcuate edge surface that contacts the anilox roll when the ink fountain is in position against the roll, and,

wherein the contoured flared portion of the end seals extends from the central portion and seats between the end of the ink tray and the end plates when the central portion is projected into the ink chamber for sealing the ends of the ink fountain at their juncture with a rotating anilox roll.

5,150,652

DEVICE FOR PUSHING PRINTING MATERIAL FOR USE IN A PRINTING APPARATUS

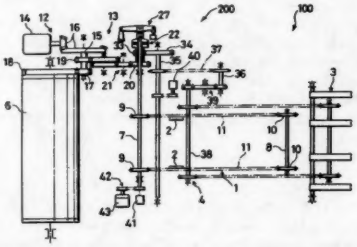
Hiroshi Yamamoto, Higashihiroshima, and Mitsuhiro Hanato, Kouchi, both of Japan, assignors to Fuji Kikai Kogyo Kabushiki Kaisha, Hiroshima and Dainippon Ink and Chemicals, Inc., Tokyo, both of, Japan

Filed Mar. 5, 1992, Ser. No. 846,314

Claims priority, application Japan, Mar. 11, 1991, 3-13448[U]

Int. Cl.[5] B41F *21/00*

U.S. Cl. 101—232 **6 Claims**



1. A device for pushing printing material for use in a printing apparatus comprising:

an impression cylinder for applying a specified printing to printing material;

first drive means for driving the impression cylinder;

pusher means for feeding the print material to the impression cylinder;

a drive shaft for driving the pusher means;

drive transmission means for transmitting driving force from the first drive means to the drive shaft;

first clutch means which engages and disengages to permit and prohibit transmission of driving force from the first drive means to the drive shaft;

actuating means for actuating the first clutch to engage and disengage;

second drive means for rotating the drive shaft;

second clutch means which engages and disengages to permit and prohibit transmission of driving force from the second drive means to the drive shaft;

control means for controlling the second clutch means to engage and disengage; and

operation means for operating the control means.

5,150,653

METHOD OF AND APPARATUS FOR CLEANING A CYLINDER

Akira Hara, Tokyo, Japan, assignor to B-J Trading Limited, Tokyo, Japan

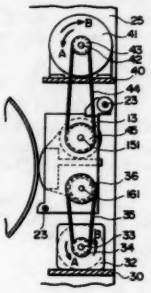
Division of Ser. No. 249,953, Sep. 27, 1988. This application Feb. 10, 1992, Ser. No. 833,551

Claims priority, application Japan, Nov. 6, 1987, 62-280644

Int. Cl.[5] B41F *35/00*

U.S. Cl. 101—483 **1 Claim**

1. A method of cleaning a cylinder comprising: pressing a cleaning cloth onto the outer peripheral surface of said cylinder while said cylinder is rotating; forwardly feeding said cleaning cloth so as to wipe off contaminant on said outer peripheral surface of said cylinder; and partially feeding backwardly the portion of said cleaning cloth which has been fed forwardly during the preceding cleaning operation, before the



next cleaning operation is started, whereby said portion of said cleaning cloth is partially used again for the cleaning in the next cleaning operation.

5,150,654

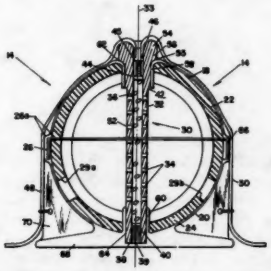
SPHERICAL IGNITER FOR FULL HEAD-END WEB ROCKET MOTORS

Roger A. Grosgebauer, Ogden, and C. Max White, Brigham City, both of Utah, assignors to Thiokol Corporation, Ogden, Utah

Filed Oct. 15, 1987, Ser. No. 109,882

Int. Cl.[5] F42C *19/08*

U.S. Cl. 102—202 **9 Claims**



1. An igniter for a rocket motor including a solid propellant having an aft-end surface, comprising:

a first plastic hemispherical shell,

a second plastic hemispherical shell,

said first and second hemispherical shells each being lined with a layer of solid igniter propellant fuel and joined together to form a solid propellant fuel lined spherical pressure vessel,

an igniter initiator for effecting ignition of the solid igniter propellant fuel lining said spherical pressure vessel, said initiator including an elongated tubular housing having an axis, a first end, and a second end and extending through said spherical pressure vessel from substantially the center of said first hemispherical shell to substantially the center of said second hemispherical shell, said elongated tubular housing being attached at said first end thereof to said first hemispherical shell and being attached at said second end thereof to said second hemispherical shell whereby said elongated tubular housing serves as a structural tie between said first and said second hemispherical shells, and

a mounting foot incorporated in said second hemispherical shell to facilitate bonding of said igniter to the aft-end

surface of the rocket motor propellant with the axis of said elongated tubular housing substantially perpendicular thereto,

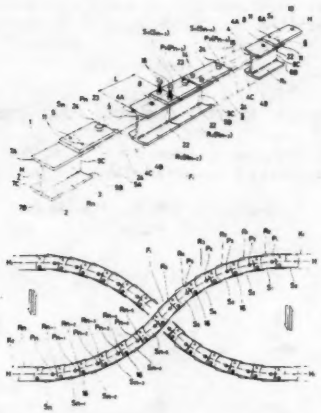
said second hemispherical shell having a plurality of nozzle ports therein spaced about the periphery thereof for igniter gas discharge against the aft-end surface of the rocket motor propellant and subsequent ignition of said rocket motor propellant.

5,150,655

HORIZONTALLY FLEXIBLE RAIL

Hideyuki Sakai, Okazaki, Japan, assignor to Nichidai Industrial Co. Ltd., Aichi and Daiwa Paint Trading Co. Ltd., Nagoya, both of, Japan

Filed Apr. 23, 1991, Ser. No. 689,327
Claims priority, application Japan, Apr. 24, 1990, 2-108220
Int. Cl.[5] B61B *7/00*
U.S. Cl. 104—89 **19 Claims**



1. A flexible rail comprising

(i) rail pieces (R_0–R_n) which are in contact with each other, intermediate ones (R_1–R_{n-1}) of the rail pieces each having a concave front end face and a convex rear end face and being in contact with adjacent rail pieces at its concave front end face and its convex rear end face, respectively,

a foremost one (R_0) of the rail pieces having a straight and flat front end face and a convex rear end face and being in contact with the adjacent rail piece (R_1) at its convex rear end face, and

a rearmost one (R_n) of the rail pieces having a concave front end face and a straight and flat rear end face and being in contact with the adjacent rail piece (R_{n-1}) at its concave front end face,

(ii) connecting plates (S_0–S_n) for connecting the rail pieces (R_0–R_n) together,

each of the connecting plates (S_1–S_n) except a foremost one (S_0) bridging adjacent rail pieces,

(iii) means for fixing each of the connecting plates (S_1–S_n) except the foremost connecting plate (S_0) on a top of one of adjacent rail pieces,

(iv) pivotal connecting means (P_1–P_n) located along a longitudinal centerline of the flexible rail for connecting each of the connecting plates (S_1–S_n) to the other one of the adjacent rail pieces such that the connecting plate, together with the rail piece to which the connecting plate is fixed, can move in an arc, in a horizontal plane, relative to the other one of the adjacent rail pieces, and

the pivotal connecting means thus connecting the adjacent rail pieces together for relative arcing motion,

(v) means for fixing the foremost connecting plate (S_0) on a top of the foremost rail piece (R_0),

(vi) arcing-motion limiting means for limiting the arcing motion of the connecting plate to a relatively small range,

(vii) the convex rear end face of each of the intermediate rail pieces (R_1–R_n) and the concave front end face of the adjacent rail piece which is in contact therewith, coinciding with a curved line produced by drawing a circle with a predetermined radius round a center of an opening of the rail piece into which the pivotal connecting means connecting the adjacent rail pieces together is inserted,

(viii) the convex rear end face of the foremost rail piece (R_0) and the concave front end face of the rail piece (R_1) located immediately behind the foremost rail piece (R_0), coinciding with a curved line produced by drawing a circle with a first given radius round a center of an opening of the foremost rail piece into which the pivotal connecting means connecting the foremost rail piece and the rail piece (R_1) together is inserted, and

said first given radius being equal to said predetermined radius, and

(ix) the concave front end face of the rearmost rail piece (R_n) and the convex rear end face of the rail piece (R_{n-1}) located immediately in front of the rearmost rail piece, coinciding with a curved line produced by drawing a circle with a second given radius round a center of an opening of the rail piece (R_{n-1}) into which the pivotal connecting means connecting the rearmost rail piece and the rail piece (R_{n-1}) together is inserted, and

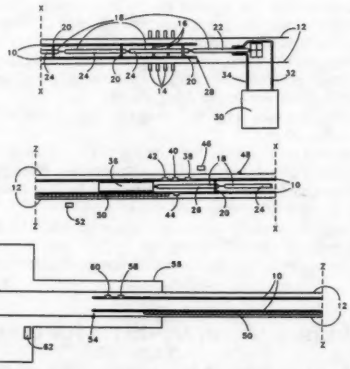
said second given radius being equal to said predetermined radius.

5,150,656

RAILROAD CAR POSITIONING APPARATUS

Ernest W. Lobb; Bruce A. Robbins, both of Aurora, and David L. Depew, Boling Brook, all of Ill., assignors to Svedala Industries, Inc., Milwaukee, Wis.

Filed Aug. 10, 1990, Ser. No. 565,644
Claims priority, application Canada, Sep. 28, 1989, 615556
Int. Cl.[5] B60J *3/08*
U.S. Cl. 104—162 **18 Claims**



1. A railroad car positioning apparatus for positioning a railroad car, the railroad car having at least two axle members spaced apart along a longitudinal axis of the railroad car, each of the at least two axle members being provided with wheels on the opposing ends thereof, each of the at least two axle members being disposed at a given height, said railroad car positioning apparatus comprising:

a carriage member;

dog means mounted on said carriage member;

means for selectively positioning said dog means and for

extending at least a portion of said dog means to at least either of a first position wherein at least a portion of said dog means extends from said carriage member to at least the height of the axle members of the railroad car for contacting at least one of the axle members of the railroad car, and a second position wherein at least a portion of said dog means is fully disposed beneath the height of the axle members of the railroad car;

said dog means comprising a first dog member and a second dog member;

each of said first and second dog members comprising at least one dog;

said first dog member for contacting a portion of each of said axle members;

said second dog member for contacting a substantially opposite portion of each of said axle members;

displacement means for displacing said carriage member in a direction parallel to the longitudinal axis of the railroad car and for exerting a force between at least a portion of said dog means and at least one of the axle members of the railroad car and for thereby moving the railroad car;

said displacement means comprising a plurality of hydraulic cylinders;

at least one of said hydraulic cylinders being disposed in series with at least another of said hydraulic cylinders;

said positioning means comprising at least one of:

a hydraulic cylinder; and

a cable;

said hydraulic cylinder being attached to said cable for moving said cable; and

said cable being connected to at least one of said first and second dog members for moving at least one of said first and second dog members.

5,150,657

TRAIN OF RAILWAY CARS HAVING TRUNCATED CONICAL RESILIENT ARTICULATION ON SHARED TRUCK BETWEEN TWO ADJACENT CARS

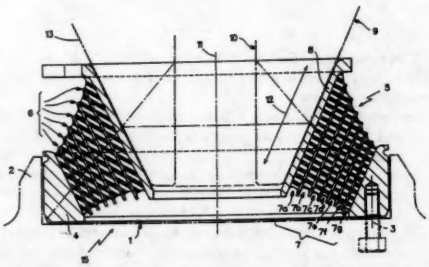
Jacques Bourgeot, Taverny, France, assignor to Caoutchouc Manufacture et Plastiques S.A., Versailles, France

Filed Dec. 28, 1990, Ser. No. 635,961

Claims priority, application France, Dec. 29, 1989, 89 17531

Int. Cl.[5] B61D *17/00*; B61G *5/02*

U.S. Cl. 105—3 **19 Claims**



11. Connecting means for connecting first and second car bodies of a railway train, the first and second car bodies being supported on a truck means, said connecting means comprising:

a resilient member;

first attaching means for attaching said first car body to said resilient member;

second attaching means for attaching said second car body to said resilient member;

said resilient member comprising:

a stack of seven truncated conical resilient elements and six truncated conical rigid elements;

said resilient elements being alternately positioned relative to said rigid elements such that each adjacent pair of resilient elements is separated by one rigid element;

said stack defining a symmetrical axis;

each said resilient element defining an average radius measured from said symmetrical axis;

each said resilient element defining a linear dimension along a straight line segment of its conical surface, such linear dimension of each said resilient element having a magnitude inversely related to the square of its corresponding average radius;

each said linear dimension of each said resilient element having two extreme ends and a midpoint between the two extreme ends;

each average radius of each said resilient element being a radius measured from the midpoint of said linear dimension to said symmetrical axis;

each said resilient element being configured to define a generally constant thickness having a magnitude inversely related to its corresponding average radius as $1/R$ where R is the corresponding average radius;

said first attaching means being a first armature;

said second attaching means being a second armature; and wherein,

said resilient elements have opposite exposed ends, each of said exposed ends defining a line thereacross, a first of said lines across said exposed ends intersecting a straight line segment defined by the conical surface of said second armature at a first angle, said first line intersecting a straight line segment defined by the inner surface of said first armature at a second angle, a second of said lines across said exposed ends intersecting said straight line segment defined by the conical surface of said second armature at a third angle, said second of said lines intersecting said straight line segment defined by the inner surface of said first armature at a fourth angle, whereby, said first angle is substantially less than said third angle, and said second angle is substantially greater than said fourth angle.

5,150,658

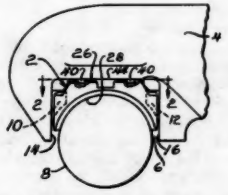
RAILCAR ADAPTER

Robert S. Grandy, Hinsdale, Ill., assignor to Unity Railway Supply Co., Inc., Bensenville, Ill.

Filed Nov. 23, 1990, Ser. No. 617,186

Int. Cl.[5] B61F *5/32*

U.S. Cl. 105—218.1 **5 Claims**



1. A bearing adapter for a railcar pedestal side frame having outboard and inboard lugs and a roof comprising

an adapter body having an upper crown and a lower saddle for contacting a bearing element,

said adapter body having a pair of opposed spaced lugs defining tracks for the outboard and inboard lugs of the pedestal side frame,

said adapter body having means for permitting lateral movement of said adapter body relative to the roof of said pedestal side frame,

said upper crown having a surface for contacting the pedestal side frame, said upper crown includes lubrication means for facilitating relative lateral movement between said adapter body and the roof of said pedestal side frame,

said lubrication means being embedded beneath said at least one surface and having a portion exposed at said surface for reducing the friction of said surface, and

said lubrication means releasing a lubricant over said surface through wiping action between said surface and the pedestal side frame during lateral movement,

said means for permitting lateral movement between said adapter body and the pedestal side frame is provided by the distance between said opposed spaced lugs being greater than the distance between the outboard and inboard lugs of the pedestal side frame for creating a clearance for said lateral movement.

5,150,659

ENTERING AND EXITING STEP SYSTEM FOR VEHICLES WITH TWO STEP PIVOTAL SUPPORT FOR ACCOMMODATING PLATFORMS OF VARYING HEIGHTS

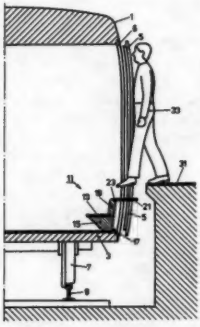
Hans Bickel, Beringen, Switzerland, assignor to Renfe, Spain

Filed Mar. 15, 1991, Ser. No. 670,350

Claims priority, application Switzerland, Nov. 29, 1990, 3778/90; Spain, Mar. 1, 1991, 9100526

Int. Cl.[5] B61D *23/02*

U.S. Cl. 105—447 **16 Claims**



1. Apparatus for enabling boarding and getting off a vehicle, wherein the vehicle includes a floor and an entry door into the vehicle for moving onto and off the floor, and wherein the floor of the vehicle is at one of either the same level as a platform outside the vehicle door, or higher than the platform, or lower than the platform;

the apparatus comprising

at least a first step generally at the floor and at the door,

height adjustable means mounting the first step in a height adjustable manner with respect to the floor of the vehicle selectively at the level of the floor of the vehicle, above the floor of the vehicle or lower than the floor of the vehicle for enabling a person boarding or getting off the floor of the vehicle through the door to move from or to the platform outside the door of the vehicle, the height adjustable means comprising a support and a pivot axis for the support, the pivot axis extending generally longitudinally of the vehicle at the door and generally at the floor of the vehicle, the first step being supported on the support at a location spaced away from the pivot axis and being pivotable around the pivot axis between a first pivot position where the first step is at one height and a second pivot position where the first step is at another height with respect to the floor of the vehicle, wherein in the first pivot position of the support, the first step is supported above the floor of the vehicle, and at the second pivot position of the support, the first step is supported below the floor of the vehicle, and

a second step supported by the support above the first step when the first step is in the first position above the floor of the vehicle, and the second step then also being located further toward the floor of the vehicle than the first step.

5,150,660

FABRIC MATERIAL AND CLOTHING APPAREL AND APPAREL ACCESSORIES MADE THEREFROM

Charles P. Kuczynski, Bayonne, N.J., assignor to Ty-Breakers Corp., Hackensack, N.J.

Filed Feb. 5, 1991, Ser. No. 650,499

Int. Cl.[5] D05B *93/00*

U.S. Cl. 112—402 **15 Claims**

1. A fabric material having a good hand and substantial feel which is suitable for making clothing apparel and apparel accessories said material comprising an outer layer of a non woven spun bonded olefin fabric material which is waterproof, windproof and weather-resistant to which is sewn or bonded a fabric lining layer of a natural or synthetic fiber or a blend thereof, said lining may be optionally fleeced.

5,150,661

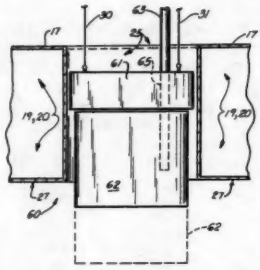
RETRACTABLE STEERING DEVICE FOR CARGO BARGES THAT INCREASES MANEUVERABILITY BY PROVIDING A PIVOT POINT OR POINTS WHEN ALTERING COURSE

William B. Rudolf, 10001 Point Aux Chenes Rd., Ocean Springs, Miss. 39564

Filed May 30, 1990, Ser. No. 530,639

Int. Cl.[5] B63H *25/00*

U.S. Cl. 114—26 **9 Claims**



1. A retractable steering device for maneuvering liquid/bulk cargo carrying barges that can be lashed together to form a tow, comprising:

a) a rectangular barge hull having a generally flat bottom and upper deck, and generally vertical port and starboard sidewalls;

b) a cargo hold contained at the central portion of and extending over a substantial portion of the barge hull area for containing a bulk or liquid cargo;

c) port and starboard wing tanks positioned respectively between the port and starboard sidewalls of the hull and the cargo hold;

d) a pair of longitudinally extending slots positioned adjacent the respective port and starboard wing tanks and defining an opening that communicates at least with the barge bottom to provide an opening to the sea under the barge bottom at the respective wing tanks; and

e) a pair of respective port and starboard steering members adapted to move within the respective slots and each being movable between an extended position wherein the steering member extends downwardly well below the barge hull bottom to increase tow maneuverability by creating a steering pivot point when the barge is being pushed, and a retracted position wherein the steering

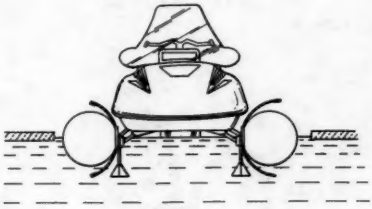
member is protectively contained within the slot, said steering members including a lower steerable portion that can be rotated when the steering member is in the extended position.

5,150,662

SNOWMOBILE FLOTATION SYSTEM

James A. Boyd, RR #2, Port Carling, Ontario, Canada P1B 3C6 , and Dan Melanson, 1267 Bancroft Drive, Sudbury, Ontario, Canada P3B 1R6

Filed Apr. 12, 1991, Ser. No. 684,235
Int. Cl.[5] B63B *5/24*
U.S. Cl. 114—68 **8 Claims**



1. In a snowmobile having a body with a forward end and a rearward end, a steerable ski at said forward end and motive power means, the improvement comprising a flotation system comprising:

(a) a plurality of flotation devices mounted at spaced locations on said snowmobile including two flotation devices on opposed sides exterior of said forward end and two flotation devices on opposed sides exterior of said rearward end;

(b) a source of inflation gas;

(c) fluid passageway means for fluidly connecting said source with said flotation devices;

(d) means for releasing said inflation gas from said source to inflate said flotation devices;

(e) each of said flotation devices including:

(i) an inflatable float fluidly connected to said fluid passageway means;

(ii) said float having a collapsed configuration, before inflation, wherein said float lies adjacent said body;

(iii) further wherein, in said collapsed configuration, said float is enclosed by a cover having first and second halves meeting at an elongated interface outward of said float with respect to said body, and fastening means at said interface releasably fastening said halves together to cover and enclose said float, said fastening means releasing upon inflation of said float.

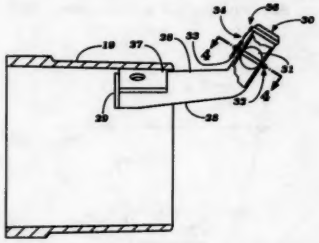
5,150,663

SIGNAL DEVICE FOR SMALL BOAT

Noboru Kobayashi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation-in-part of Ser. No. 922,280, Oct. 23, 1986. This application Dec. 4, 1990, Ser. No. 624,067
Claims priority, application Japan, Dec. 5, 1989, 1-317110
Int. Cl.[5] B63H *11/10*
U.S. Cl. 116—209 **6 Claims**

1. A signalling device for a jet propelled watercraft having an outer housing assembly defining a water inlet to receive water from a body of water in which the watercraft is operating, an impeller portion containing an impeller for drawing water through said inlet, and a discharge nozzle through which water is discharged by said impeller for propelling said watercraft, a signalling device having an inlet opening fixed permanently within said discharge nozzle and adapted to receive water under pressure from said impeller and a discharge portion having an upwardly facing opening for upward discharge of water from said signalling device, and a butterfly type valve



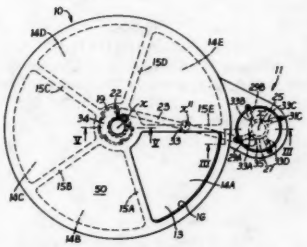
for precluding the upward discharge of water from said signalling device.

5,150,664

DISPENSING DEVICE

Christopher P. Kirk, Sunbury-on-Thames, United Kingdom, assignor to Pet Mate Limited, Shepperton, United Kingdom

Filed Aug. 22, 1991, Ser. No. 748,821
Claims priority, application United Kingdom, Aug. 24, 1990, 9018674
Int. Cl.[5] A01K *5/02*
U.S. Cl. 119—51.12 **12 Claims**



1. A dispensing device comprising a main element, means biassing the main element to tend to rotate in one sense about an axis of the main element, a control element, means for driving the control element in constant rotation about an axis of the control element, a series of abutments of the main element in an array stepped circumferentially about said axis thereof, a series of cam surfaces of the control element in an array stepped circumferentially about said axis thereof, a cam follower and means for maintaining one end of the cam follower in contact with one of said series of abutments and its other end in contact with said series of cam surfaces such that as the cam follower passes relatively from one cam surface to another it disengages said one abutment to permit an indexing movement of the main element under the bias thereof which is arrested when the cam follower engages an abutment next adjacent said one abutment.

5,150,665

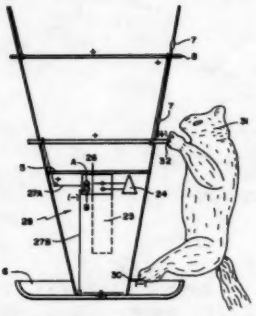
BIRD POWER FEEDER

John M. D. Boaz, 14222 Rock Canyon Dr., Centreville, Va. 22020

Continuation-in-part of Ser. No. 594,625, Oct. 9, 1990, abandoned. This application Aug. 22, 1991, Ser. No. 748,546
Int. Cl.[5] A01K *39/00*
U.S. Cl. 119—52.3 **22 Claims**

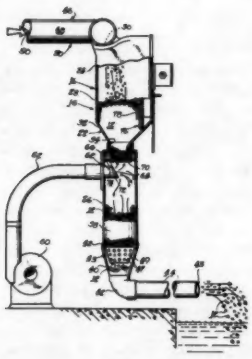
1. A bird feeder for feeding multiple sized birds comprising:

a hollow geometrically shaped reservoir with a top opening an sidewalls which extend down to a bottom;
a door at the top of said reservoir shaped to close the top opening;
a feed tray assembly attached to the bottom of said reservoir; and,



a plurality of access holes through the sidewalls of said reservoir;
a removable trim mechanism engaging one or more of said access holes, wherein each trim mechanism includes a snap-fit connection means, an opening, and a removable disc positioned in said opening for varying the size of said access hole.

5,150,666
FEEDING APPARATUS
Timothy W. Momont, Wolcottville, and Charles R. Bird, Milford, both of Ind., assignors to CTB, Inc., Milford, Ind.
Filed Nov. 1, 1991, Ser. No. 786,580
Int. Cl.[5] A01K *5/02, 61/02*
U.S. Cl. 119—57.91 **16 Claims**



1. A feeding apparatus for dispersing food to an organism comprising: feed conveyor means and feed dispersion means; the feed dispersion means having a feed inlet, a feed outlet, an upper chamber and a lower chamber; the feed inlet being connected to the upper chamber, and the feed outlet being connected to the lower chamber; the feed conveyor means being connected to the feed inlet for filling the upper chamber with food; expulsion means connected with the lower chamber for supplying a driven fluid to the feed dispersion means for forcibly expelling food therefrom; valve means disposed within the feed dispersion means shiftable between a filling position and a dispersing position; and the filling position being defined by the valve means allowing food to flow from the upper chamber into the lower chamber, and the dispersing position being defined by the valve means allowing dispersion of the food from the lower chamber while preventing food from flowing from the upper chamber to the lower chamber.

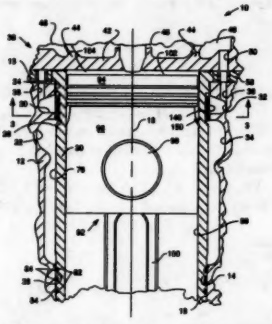
5,150,667
RESTRAINING APPARATUS FOR SMALL ANIMALS
Cecilia Salidrigas, 7519 Palm Rd., West Palm Beach, Fla. 33406
Filed Dec. 4, 1991, Ser. No. 802,103
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—96 **8 Claims**

1. An animal restraining apparatus for restraining and controlling an animal without applying any force to the animal's neck; wherein, the apparatus consists of:
a pair of enlarged generally circular leg engaging members wherein each leg engaging member is provided with an upper portion and a lower portion and is dimensioned to loosely surround the animal's foreleg, and to extend substantially around the animals shoulders;
first connection means extending underneath the chest of the animal and operatively engaged with the lower portions of said leg engaging members; and,
an elongated flexible strap member having opposite ends provided with adjustment means operatively associated with the upper portions of said leg engaging members and extending across the animals back; wherein, said adjustment means form a second operative connection between the leg engaging members; wherein, said elongated flexible strap member is further provided with a ring element intermediate the opposite ends of the strap member; wherein, the ring element is dimensioned to be engaged by a conventional leash.

5,150,668
CYLINDER LINER WITH COOLANT SLEEVE
Allyn P. Bock, Chillicothe, Ill., assignor to Caterpillar, Inc., Peoria, Ill.
Filed Feb. 20, 1992, Ser. No. 838,182
Int. Cl.[5] F02F *1/14*
U.S. Cl. 123—41.8 **35 Claims**

1. An internal combustion engine comprising:
a block defining a cylinder bore, an upper annular recess, and a lower annular recess;
a cylinder liner having a central axis located in the cylinder bore and cooperating with the upper and lower annular recesses to define upper and lower, axially spaced, annular coolant chambers; and
a sleeve being disposed between the upper and lower coolant chambers, extending into the upper coolant chamber,

and surrounding the cylinder liner, the sleeve and the cylinder liner defining a plurality of circumferentially



spaced venturi throats adapted to communicating the lower coolant chamber with the upper coolant chamber.

5,150,669

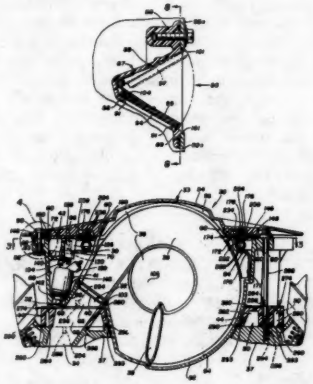
PRESSURE RELIEF MEANS FOR INTEGRATED INDUCTION SYSTEM

William B. Rush, II, Clarkston; Jack E. Elder, Rochester, and Richard K. Shier, Livonia, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 432,295, Nov. 6, 1989, Pat. No. 5,003,933. This application Aug. 30, 1990, Ser. No. 575,532

Int. Cl.[5] F02B *75/26*

U.S. Cl. 123—52 MF **5 Claims**



1. An integrated induction system to provide fluids to the cylinders in an engine, comprising:

a casing adapted for mounting on the engine, said casing having an air inlet and a plurality of fluid outlets, each of said fluid outlets being adapted to communicate with a respective cylinder, said casing comprising an enclosure defined by two casing members, said casing including a fastener to securely hold the casing members together;

a component comprising a plurality of air tubes mounted in the casing to facilitate provision of fluids to the cylinders, said air tubes occupying a portion of the interior of said casing with the unoccupied portion of said casing constituting a plenum, said air tubes being positioned within said casing so that said plenum provides a flow path from said air inlet to said air tubes, one end of each of said air tubes opening from said plenum and the other end of each of said air tubes engaging said casing adjacent one of said fluid outlets to allow communication between said plenum and the cylinders so that air entering into said plenum through said air inlet is introduced via each of said air tubes into the respective cylinders; and

means for venting said casing when the pressure therein reaches or exceeds a predetermined limit.

5,150,670

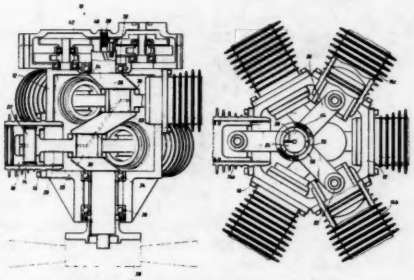
RADIAL INTERNAL COMBUSTION ENGINE

William G. Sadler, Scottsdale, Ariz., assignor to Harold W. Gewald, Coupeville, Wash.

Filed Apr. 6, 1990, Ser. No. 506,443

Int. Cl.[5] F02B *75/22*

U.S. Cl. 123—55 R **6 Claims**



1. A radial internal combustion engine, comprising:

(a) an engine housing;

(b) a plurality of pistons and cylinders equally spaced in two rows about the periphery of said engine housing, a piston received within each of said cylinders;

(c) a crankshaft axially positioned along the longitudinal axis of said housing, said crankshaft including crankshaft journal means defining a circular translatory path about the longitudinal axis of said crankshaft;

(d) three connecting rods retained on said crankshaft journal means, said connecting rods lying in a common plane about said crankshaft journal means, wherein each of said connecting rods terminate in an arcuate flange at a lower end thereof, said arcuate flanges having a radius of curvature equal to the radius of curvature of said crankshaft means;

(e) retaining ring means journaled about a lower end of said connecting rods for retaining said connecting rods on said crankshaft journal means, wherein said retaining ring means comprises a pair of split rings journaled about said crankshaft journal means and said arcuate flanges of said connecting rods; and

(f) wherein said crankshaft includes a lubricant passage extending through said crankshaft, said lubricant passage branching and terminating at separate outlet ports, which outlet ports are periodically exposed by the circular translatory path of said crankshaft journal means permitting lubricant to spray into said engine housing.

5,150,671

INTAKE- AND/OR EXHAUST-VALVE TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Seiji Suga, Kanagawa, Japan, assignor to Atsugi Unisia Corporation, Kanagawa, Japan

Filed Oct. 30, 1991, Ser. No. 784,765

Claims priority, application Japan, Oct. 31, 1990, 2-294942

Int. Cl.[5] F01L *1/34*

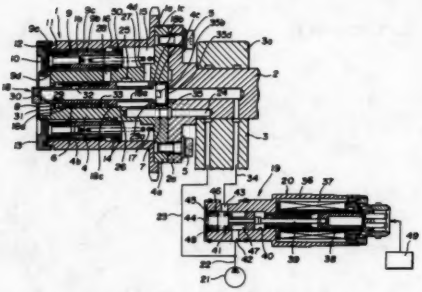
U.S. Cl. 123—90.17 **8 Claims**

1. In an intake- and/or exhaust-valve timing control system

for an internal combustion engine including a ring gear member disposed between a rotating member having a driven connection with an engine crankshaft and a camshaft for adjusting the phase angle between said rotating member and said camshaft, a drive mechanism provided for drivingly controlling said ring gear member via fluid pressure depending upon the operating state of said engine; the improvement comprising:

said drive mechanism including;

a first hydraulic circuit for creating one axial movement of said ring gear member in one axial direction of said camshaft;



a second hydraulic circuit for creating the other axial movement of said ring gear member in the opposing axial direction of said camshaft;

switching means disposed in said camshaft for selectively switching from one of said first and second hydraulic circuits to the other; and

fluid pressure control means for generating a control fluid pressure depending upon the operating state of said engine to control said switching means via said control fluid pressure.

5,150,672

CYLINDER HEAD OF AN INTERNAL COMBUSTION ENGINE

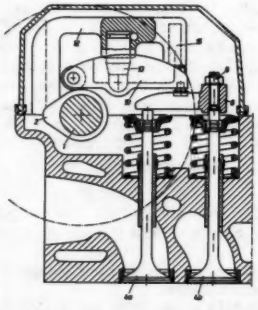
Christof D. Fischer; Wolfgang Petutschnig, and Karl Wojik, all of Graz, Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. Hans List, Graz, Austria

Filed Mar. 5, 1992, Ser. No. 846,045

Claims priority, application Austria, Mar. 12, 1991, A545/91

Int. Cl.[5] F01L *1/26*

U.S. Cl. 123—90.22 **3 Claims**



1. Cylinder head of an internal combustion engine, comprising two rocker arms for each cylinder, each of said rocker arms having a pivot being individually supported on said cylinder head by means of a bridge, wherein at least one of said rocker arms acts on a valve bridge actuating two overhead valves of indentical function, wherein said at least one valve bridge is suspended by said bridge, and wherein said pivots of said rocker arms have different distances from a center plane of said cylinder.

5,150,673

FUEL SUPPLYING DEVICE FOR MARINE PROPULSION ENGINE

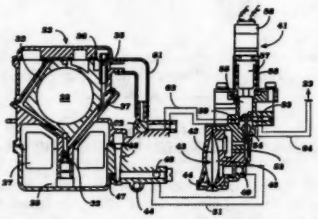
Akihiro Hoshiba; Masaki Okazaki, and Junichi Hasegawa, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 12, 1991, Ser. No. 685,129

Claims priority, application Japan, Apr. 13, 1990, 2-98396

Int. Cl.[5] F02M *1/08*

U.S. Cl. 123—179.15 **20 Claims**



1. In an enrichment device for providing additional fuel to an engine for accommodating a certain condition, said engine comprising a charge former having a fuel bowl for containing a head of fuel, a discharge circuit comprised of a fuel conduit connecting said fuel bowl with a discharge port in an induction passage of said charge former, an air conduit continuously communicating a source of atmospheric air with said fuel conduit for mixture of air with the fuel delivered through said discharge port under all discharge conditions, said enrichment device comprising means for delivering fuel and air to said engine in addition to that supplied by said charge former under certain conditions, the improvement comprising said additional air being supplied to said engine by said enrichment device being drawn from said air conduit for reducing the pressure in said fuel conduit of said charge former for further increasing the fuel delivered to said engine in response to the certain condition.

5,150,674

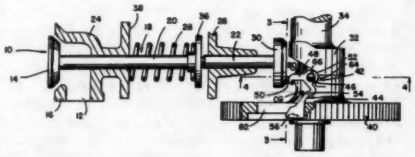
CENTRIFUGALLY RESPONSIVE COMPRESSING RELEASE MECHANISM

Gary J. Gracyalny, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed May 21, 1991, Ser. No. 703,616

Int. Cl.[5] F01L *13/08*

U.S. Cl. 123—182.1 **32 Claims**



1. An internal combustion engine having a combustion chamber, comprising:

valve means for controlling the flow of a gas to said combustion chamber, said valve means including a valve seat;

valve operating means for unseating said valve means from said valve seat;

a camshaft having an outer surface and also including:

at least one pivot pin extending from the outer surface of said camshaft;

at least one shoulder means near said pivot pin for bearing load forces of said valve operating means;

a cam disposed on said camshaft that engages said valve operating means to unseat said valve means;

a compression release means for releasing compression in said combustion chamber at engine cranking speeds, comprising:

a compression release member that partially surrounds said camshaft and that is pivotally connected to said camshaft by said pivot pin;

an auxiliary cam member affixed to said compression release member that engages said valve operating means to unseat said valve means at engine cranking speeds;

a first surface on said compression release member that abuts said shoulder means when said auxiliary cam member engages said valve operating means to transfer loads from said auxiliary cam member to said shoulder means; and

weight means, responsive to centrifugal force, for pivoting said compression release member about said pivot pin at engine running speeds to disengage said auxiliary cam member from said valve operating means.

5,150,675

CYLINDER HEAD ASSEMBLY FOR USE IN INTERNAL COMBUSTION ENGINE

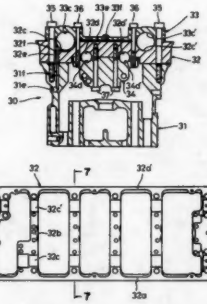
Shinichi Murata, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 798,753

Claims priority, application Japan, Nov. 29, 1990, 2-126833[U]

Int. Cl.[5] F02F *3/00*

U.S. Cl. 123—193.5 **4 Claims**



1. A cylinder head assembly for use in an internal combustion engine, which includes a valve drive mechanism having a plurality of pairs of a rocker-arm shaft and a rocker arm, the rocker-arm shafts being rotatably supported by journal portions of a cylinder head, and the rocker arms being swingable together with the rocker-arm shafts, said cylinder head assembly comprising:

rocker shaft supporting means for supporting the rocker-arm shafts incorporated in the cylinder head, said rocker shaft supporting means having a plurality of cap portions supporting the rocker-arm shafts, disposed in parallel with each other in one direction, and corresponding in number to journal portions of the cylinder head, and pairs of beam portions respectively supporting both sides of the plurality of cap portions, and extending in parallel with each other in another direction, wherein the cap portions and pairs of beam portions are formed to be integral with each other in a ladder frame structure.

5,150,676

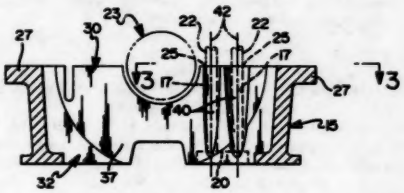
SEALED MACHINED MEMBER

John E. Brevick, Livonia; Steven P. Bittner, Flint, and Briant J. Kling, Redford, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1991, Ser. No. 773,163

Int. Cl.[5] F02F *7/00*

U.S. Cl. 123—195 R **3 Claims**



1. A sealed machined member comprising:

a casted block member having an outer surface including a machined portion and a scalloped portion which adjoins said machined portion, said scalloped portion being cast into said outer surface when said block member is casted;

a wet passage formed in said block member for containing fluid having a pressure which is greater than the pressure adjacent to the outer surface, said wet passage having a longitudinal axis which defines a passage plane, said passage plane extending between the longitudinal axis of said wet passage and the part of said outer surface nearest to said wet passage; and

said scalloped portion being oriented so that its longitudinal axis lies in said passage plane, said scalloped portion being recessed from said outer surface so that said scalloped portion is not machined when said outer surface is machined.

5,150,677

DIRECT INJECTION DIESEL ENGINE

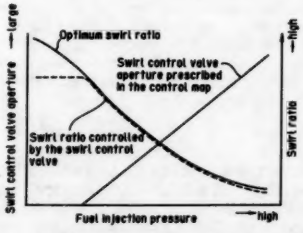
Shunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1991, Ser. No. 746,012

Claims priority, application Japan, Aug. 16, 1990, 2-216166

Int. Cl.[5] F02M *35/10*; F02D *9/10*

U.S. Cl. 123—302 **11 Claims**



11. A direct injection diesel engine wherein fuel is injected directly into a combustion chamber formed by a cylinder, a cylinder head, and a piston, comprising:

a fuel injector fitted to the cylinder head and facing the center of said combustion chamber,

a fuel injection pump which supplies high pressure fuel to said fuel injector in synchronization with the engine,

two air intake ports and two exhaust ports disposed in opposition to each other around said fuel injector,

air intake valves and exhaust valves which respectively open and close said air intake ports and exhaust ports in synchronization with the engine,

a swirl control valve provided in one of said air intake ports, and

a control means to adjust the aperture of the swirl control valve as a function of the injection pressure of said fuel injector,

wherein said control means is an electronic control unit provided with a control map specifying the relation between the injection pressure and the aperture of said swirl control valve and wherein said control map causes the aperture of said swirl control valve to vary in linear proportion to said injection pressure.

5,150,678

MOTOR BRAKE FOR AIR-COMPRESSING INTERNAL COMBUSTION ENGINES

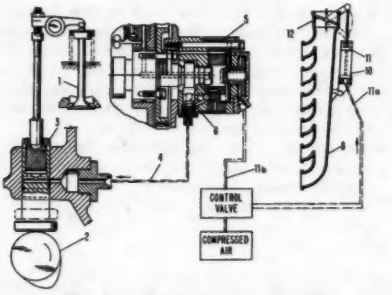
Dieter Wittmann, and Heribert Kubis, both of Nürnberg, Fed. Rep. of Germany, assignors to MAN Nutzfahrzeuge Aktiengesellschaft, München, Fed. Rep. of Germany

Filed Jul. 12, 1990, Ser. No. 552,180

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1989, 3922884

Int. Cl.[5] F02D *9/06, 13/04*

U.S. Cl. 123—321 **6 Claims**



1. A motor brake for an air-compressing internal combustion engine, comprising:

piston means built into a valve drive as an additional means for an exhaust valve that is actuatable by a cam drive, with said piston means being supplied with hydraulic fluid from a hydraulic pump unit having pump pistons, a respective one of which is associated with each piston means of an exhaust valve, with said pump pistons being controlled by a cam that rotates synchronously with said cam drive;

a butterfly valve disposed in an engine exhaust manifold;

a control mechanism for controlling said butterfly valve; and

a common control valve for activating said hydraulic pump unit and said control mechanism synchronously at least at full braking power.

5,150,679

ELECTRONIC BUTTERFLY VALVE ADJUSTER HAVING CONTINUOUS FAULT MONITORING SYSTEM

Cornelius Peter, Ottersweiher, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP89/00024, § 371 Date Jun. 21, 1991, § 102(e) Date Jun. 21, 1991, PCT Pub. No. WO90/08251, PCT Pub. Date Jul. 26, 1990

PCT Filed Jan. 12, 1989, Ser. No. 720,460

Int. Cl.[5] F02D *11/10, 41/22*

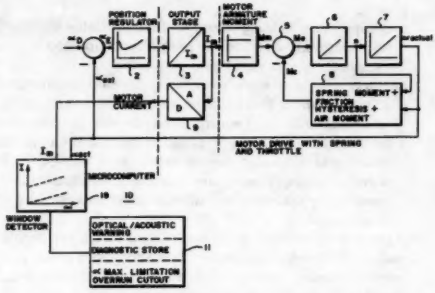
U.S. Cl. 123—397 **2 Claims**

1. An electronic control system of a butterfly valve in the intake system of a motor vehicle engine wherein the operating position of the butterfly valve is controlled according to an accelerator position, the electronic control system comprising:

an electronically controlled adjusting device including an adjusting motor for driving the butterfly valve in an opening or closing direction in accordance with a control signal; and, a current supply for supplying a supply current to said adjusting motor;

a return spring which continuously biases the butterfly valve towards a closed or idling position of the valve;

a position sensor which outputs an electrical signal representative of the actual prevailing position of the butterfly valve;



means for monitoring the supply current to said adjusting motor of the adjusting device;

means for determining limit values as a function of the actual position of the throttle flap according to the sum of all the mechanical moments occurring in the adjusting device; and,

means for detecting a fault condition when the supply current is outside the predetermined limits.

5,150,680

INTERNAL COMBUSTION ENGINE CONTROL METHOD AND APPARATUS

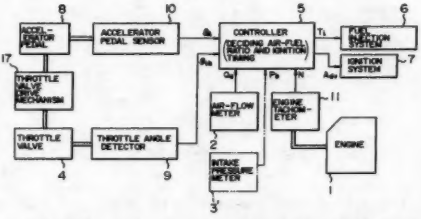
Yutaka Nishimura, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1991, Ser. No. 661,477

Claims priority, application Japan, Feb. 2, 1990, 2-22025

Int. Cl.[5] F02D *41/18;* **F02P** *5/15;* **F02M** *25/07*

U.S. Cl. 123—399 **15 Claims**



1. An internal combustion engine control method by which the engine output is controlled by controlling a throttle valve of an intake air passage by an accelerator pedal, comprising the steps of:

setting an operation of said throttle valve so that a throttle opening angle changes according to a travel amount of said accelerator pedal in the range from the minimum value to a predetermined value less than the maximum value of said accelerator pedal travel amount and that said throttle valve is in a full-open state in the range from said predetermined value to the maximum value of said accelerator pedal travel amount;

supplying an air-fuel mixture of a first air-fuel ratio in said throttle opening angle range corresponding to the range of said accelerator pedal travel amount from the minimum value until said predetermined value is reached; and

supplying an air-fuel mixture of a second air-fuel ratio different from said first air-fuel ratio in said throttle opening angle range corresponding to the range of said accelerator pedal travel amount from said predetermined value to the maximum value.

5,150,681

SUPERVISORY SYSTEM FOR A VEHICLE ACCELERATOR PEDAL TRAVEL TRANSDUCER

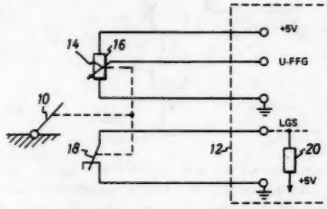
Hermann Kull, Stuttgart; Joachim Berger, Winterbach; Ulrich Gerstung, Vaihingen/Enz, and Klaus Bleuel, Oestrich-Winkel, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP89/01099, § 371 Date May 21, 1991, § 102(e) Date May 21, 1991, PCT Pub. No. WO91/04400, PCT Pub. Date Apr. 4, 1991

PCT Filed Sep. 21, 1989, Ser. No. 688,489

Int. Cl.[5] F02D *11/10, 41/22;* **B60Q** *1/44*

U.S. Cl. 123—399 **27 Claims**



1. A supervisory system for monitoring an accelerator pedal travel transducer in an electronic control system for a combustion engine, the system comprising:

an idling pressure switch for detecting the idling position of the accelerator pedal;

means for actuating said pressure switch by taking up lost motion travel of the accelerator pedal from said idling position before said pedal transducer is displaced from said idling position;

means for providing an additional idle position signal; composite means having respective inputs for receiving said additional idle position signal, the signal of said idling pressure switch and the signal of said accelerator pedal transducer; and,

said composite means being provided for generating an alarm signal in response to said signals applied to said inputs when at least one of said signals applied to said inputs is not plausible to the remaining ones of said signals applied to said inputs.

5,150,682

METHOD OF MONITORING EMISSION OF NITROGEN OXIDES BY AN INTERNAL COMBUSTION ENGINE

Jean-Louis Magnet, St. Germain en Laye, France, assignor to S.E.M.T. Pielstick, France

Filed Sep. 26, 1991, Ser. No. 765,735

Claims priority, application France, Sep. 26, 1990, 90 11860

Int. Cl.[5] F02B *77/08;* **F02P** *5/155*

U.S. Cl. 123—417 **9 Claims**

1. Method of monitoring the emission of nitrogen oxides, NOx, in the exhaust gas of an internal combustion engine, comprising the steps of:

installing an accelerometer on a component delimiting a combustion chamber of a control engine analogous to the engine to be monitored,

installing a known device for measuring the emission of nitrogen oxides in the exhaust gas of the control engine,

operating the control engine at various loads and various speeds to cover the full operating range of the control engine,

simultaneously recording data concerning an accelerometer signal, a characteristic parameter of which is calculated, the measured quantity of nitrogen oxides NOx contained in the exhaust gas of the control engine and characteristic engine operating parameters, including at least its speed, loaf and cylinder air inlet temperature,

establishing, on the basis of the recorded data, a correlation between the measured quantity of nitrogen oxides and the characteristic parameter of the accelerometer signal,

installing an accelerometer on the engine to be monitored subject to the same conditions as on the control engine,

simultaneously recording, foe the engine to be monitored in operation, data concerning the accelerometer signal, the characteristic parameter of which is calculated, and the characteristic engine parameters including at least its speed, load and cylinder inlet air temperature,

establishing, from the data recorded in the previous stage and from the correlations established for the control engine, an equivalent nitrogen oxide emission value for the engine to be monitored,

taking decisions, if appropriate, as to actions needed to comply with a set point value imposed of the emission of nitrogen oxides.

5,150,683

FLEXIBLE FUEL SENSOR SYSTEM

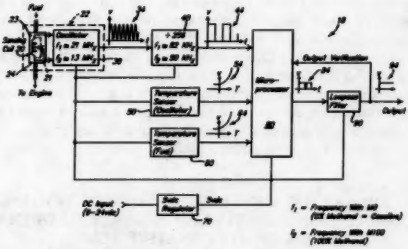
Henry F. Depa, Sterling Heights, and John J. C. Kopera, Rochester Hills, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 12, 1991, Ser. No. 667,911

The portion of the term of this patent subsequent to Jun. 9, 2009, has been disclaimed.

Int. Cl.[5] F02P *5/15;* **F02D** *41/06*

U.S. Cl. 123—417 **23 Claims**



1. A method of determining the respective percentages of first and second liquids in a mixture thereof, comprising the steps of:

immersing an inductive element in said mixture such that said mixture at least partially determines a value of the distributed capacitance exhibited by the inductive element;

energizing said inductive element to generate a signal having a frequency determined by said inductive element and by its distributed capacitance; and

detecting the frequency of said signal.

5,150,684

HIGH PRESSURE FUEL INJECTION UNIT FOR ENGINE

Taue Jun, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 21, 1990, Ser. No. 632,911

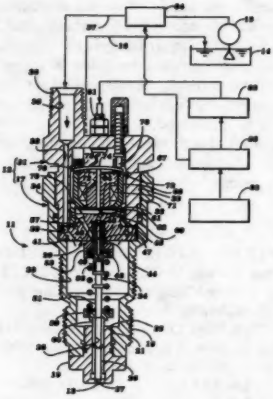
Claims priority, application Japan, Dec. 25, 1989, 1-336929

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—446 **20 Claims**

1. An accumulator type of fuel injection nozzle comprised of an accumulator chamber adapted to be supplied with high

pressure fuel, a nozzle port leading from said accumulator chamber, an injector valve moveable between a closed position and an opened position for controlling the discharge of fuel from said accumulator chamber through said nozzle port, a control chamber for receiving pressurized fuel, an actuating member supported for movement within said control chamber and associated with said injector valve for retaining said injector valve in its closed position when said control chamber is pressurized and for movement of said injector valve to its opened position when pressure is relieved in said control chamber, and relief valve means moveable between a closed



position for maintaining pressure in said control chamber and an opened position for relieving said control chamber for effecting fuel discharge through said nozzle port, the improvement comprising means for opening the relief valve at a substantially fixed output shaft angle of the associated engine which does not vary by more than about 5° regardless of the engine running condition, and closing the control valve at an approximately fixed output shaft angle which does not vary by more than about 10° regardless of the engine running condition, and means for varying the fuel pressure delivered to the accumulator chamber to vary the output of the engine.

5,150,685

APPARATUS AND METHOD FOR CONVERTING CONVENTIONALLY FUELED ENGINES TO OPERATE ON AN ALTERNATIVE FUEL

Fred C. Porter, 31065 Stafford Dr., Birmingham, Mich. 48010, and Garth J. Schultz, 2111 Lovington Ave., Apt. #106, Troy, Mich. 48083

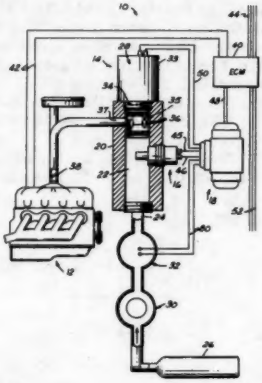
Filed Sep. 11, 1991, Ser. No. 758,894
Int. Cl.[5] F02D *41/04;* F02M *21/02*
U.S. Cl. 123—478 **13 Claims**

1. Apparatus for converting a conventionally fueled internal combustion engine to operate with an alternative fuel, the engine having an electronic control module which generates a control signal for output to a conventional fuel injector, the apparatus comprising:

an alternative fuel introduction assembly including a housing having an interior chamber, an inlet passage in fluid communication with a source of alternative fuel, and an alternative fuel injector moveable between an open position adapted to place the interior chamber in fluid communication with the engine and a closed position adapted to seal the interior chamber from fluid communication with the engine;

a temperature sensor adapted to measure the temperature of the alternative fuel and to generate an output signal indicative of the measured temperature; and

an electronic translator in electrical contact with the alternative fuel introduction assembly, the temperature sensor, and the electronic control module, the electronic translator adapted to receive the control signal and the output signal, and to generate an alternative fuel injector control signal in accordance with the energy content differential of conventional fuel and the alternative fuel, and also in accordance with the flow characteristics and operating



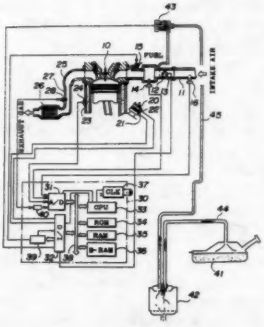
characteristics of the alternative fuel injector, for output to the alternative fuel introduction assembly, the alternative fuel injector control signal controlling the period of time the alternative fuel injector remains in the open position so as to meter the flow of the alternative fuel to the engine.

5,150,686

EVAPORATIVE FUEL CONTROL APPARATUS OF INTERNAL COMBUSTION ENGINE

Koji Okawa, and Kazuhiko Norota, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 7, 1991, Ser. No. 741,583
Claims priority, application Japan, Aug. 8, 1990, 2-211261
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—698 **7 Claims**



1. An evaporative fuel control apparatus comprising:

detection means for detecting operating conditions of an internal combustion engine and for supplying signals indicative of said operating conditions;

purge means for controlling a flow of fuel vapor from a fuel tank into an intake passage of the internal combustion engine;

calculation means for calculating a fuel injection amount in response to said signals supplied by said detection means;

fuel injection control means for varying a feedback correction factor of an air-fuel ratio of air fuel mixture, in response to said signals supplied by said detection means, so as to maintain the air-fuel ratio at a stoichiometric value, and for correcting the fuel injection amount being calculated by the calculation means on the basis of the varied feedback correction factor;

purge correction means for correcting a purging amount of fuel vapor which is fed by said purge means into the intake passage, in response to the feedback correction factor varied by the fuel injection control means, so that the feedback correction factor is adjusted to be within a predetermined range; and

prohibition means for preventing said purge correction means from correcting said purging amount of fuel vapor when the feedback correction factor is not within said predetermined range and it is determined based on said signals that the feedback correction factor has changed from a value outside the predetermined range to a value within the predetermined range.

5,150,687

SUPPLY CIRCUIT FOR OPERATION OF AN ELECTROMAGNETIC LOAD

Henri Paganon, Venissieux, and Guy Pichon, Roussillon, both of France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

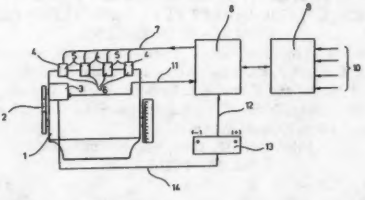
PCT No. PCT/DE90/00405, § 371 Date Oct. 2, 1991, § 102(e) Date Oct. 2, 1991, PCT Pub. No. WO91/00421, PCT Pub. Date Jan. 10, 1991

PCT Filed May 30, 1990, Ser. No. 768,916

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1989, 3921308

Int. Cl.[5] F02D *41/20*

U.S. Cl. 123—490 **18 Claims**



1. A supply circuit for operation of an electromagnetic load of a vehicle having a generator and battery, and a load including at least one solenoid valve of a fuel-injection system of an internal-combustion engine of the vehicle, comprising:

a circuit arrangement which connects the load to the generator for a buildup of excitation of the load, and then establishes a connection of the load to the battery and interrupts the connection of the load to the generator for the maintenance of sufficient excitation of the load.

5,150,688

MAGNET VALVE, IN PARTICULAR FOR FUEL INJECTION PUMPS

Heinz Nothdurft, Stuttgart; Reinhard Trunk, Schwieberdingen; Kurt Sprenger, Illingen-Schützing, and Carlos Alvarez-Avila, Freiberg/Neckar, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

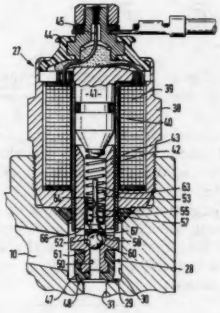
PCT No. PCT/DE90/00740, § 371 Date Jun. 7, 1991, § 102(e) Date Jun. 7, 1991, PCT Pub. No. WO91/05950, PCT Pub. Date May 2, 1991

PCT Filed Sep. 28, 1990, Ser. No. 687,926

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1989, 3934953

Int. Cl.[5] F02M *37/04*

U.S. Cl. 123—506 **8 Claims**



1. A magnet valve for controlling a fuel supply to injection pumps for supplying fuel to internal combustion engines, which comprises an intake line (10) that connects a pump work chamber (6) of the fuel injection pump to a fuel supply source (11), said magnet valve is positioned relative to said intake line (10) to block fuel flow to control an end of the fuel injection and to permit fuel through said intake line (10) said pump work chamber during an intake stroke of a pump piston (4); said magnet valve includes a closing element (28) connected to an armature (42) of said magnet valve, said closing element and said armature are retained by a restoring spring (43) in a closed position of said closing element on a valve seat (29) formed in said intake line (10) from which the intake line (10, 31, 32, 33) leads to said pump work chamber (6), and said closing element is acted upon in the closing position by a pressure prevailing in the intake line toward the valve seat, said closing element includes a bore (50) which connects a portion of said intake line (10) to parts of the intake line toward said pump work chamber which bore is closable by a valve member (61) acted upon by a closing spring (57) counter to the pressure in the portion of the intake line toward the pump work chamber, said closing spring (57) is supported in the armature (42) and said restoring spring (43) is supported in a stationary manner at one end.

5,150,689

FUEL TANK VAPOR CONTROL SYSTEM WITH MEANS FOR WARNING OF MALFUNCTION OF CANISTER

Hirofumi Yano, Yokohama, and Seiji Yokoi, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 12, 1991, Ser. No. 758,911

Claims priority, application Japan, Sep. 14, 1990, 2-244687

Int. Cl.[5] F02M *33/02*

U.S. Cl. 123—519 **8 Claims**

1. A fuel tank vapor control system for an automotive vehicle comprising:

a fuel tank with hydrocarbon vapors;

a canister for adsorbing the hydrocarbon vapors from said fuel tank;

engine induction passage means;

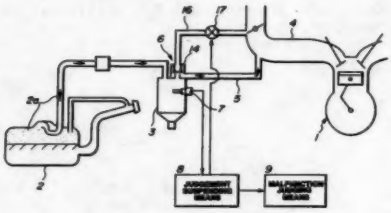
purge passage means for supplying the hydrocarbon vapors regenerating from said canister to said engine induction passage means;

valve means for selectively opening and closing said purge passage means;

temperature sensor means for detecting an inside temperature of said canister;

judgement suspending means for suspending a judgement on malfunction of said canister when opening of said purge passage means is ineffective for causing an inside temperature fall of said canister, and once closing said purge passage means so that said canister fully adsorbs the hydrocarbon vapors; and

malfunction judging means for judging that said canister is malfunctioning when opening of said purge passage means after said closing thereof by said malfunction suspending means is still ineffective for causing an inside temperature fall of said canister.



5,150,690

FLOW CONTROL SYSTEM

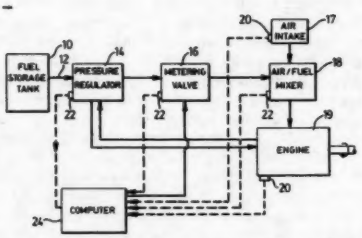
Stephen A. Carter, Mississauga; Bryan C. Williamson, Burlington, and Karl H. Kozole, Weston, all of Canada, assignors to Ortech Corporation, Ontario, Canada

Filed Apr. 20, 1990, Ser. No. 512,300

Claims priority, application Canada, Sep. 29, 1989, 614540

Int. Cl.[5] F02B *43/00*

U.S. Cl. 123—527 **24 Claims**



1. Apparatus for controlling the rate of flow of a fluid from a common inlet to a common outlet comprising:

(a) a plurality of fluid conducting lines having a plurality of flow capacities, said plurality of lines being connected in parallel between said common inlet and said common outlet such that the total flow from said common inlet to said common outlet is equal to the sum of the separate flows through the individual lines;

(b) a pulsing fluid control valve in each of at least two of said lines, and a bi-stable fluid control valve in each of the remaining lines;

(c) sensors for measuring parameters of the fluid sufficient to determine the potential mass flow of said measured fluid through each control valve when open;

(d) control means adapted to control selectively the opening and closing of said control valves and monitor the sensors to determine the potential mass flow through each control valve in accordance with the measured fluid parameters, the total fluid flow passing outwardly of said common outlet comprising abase flow component established by opening selected control valves to provide a continuous predetermined flow, discrete step changes in the base flow component being provided by opening and closing combinations of control valve, increments of fluid flow between said discrete steps being provided by opening at least one predetermined pulsing valve for a fraction of a predetermined time period to provide a desired average flow over said time period.

5,150,691

ENGINE FUEL INJECTOR

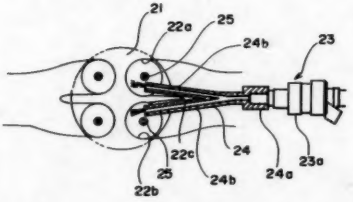
Minoru Imajo, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jan. 23, 1992, Ser. No. 824,624

Claims priority, application Japan, Jan. 25, 1991, 3-7803

Int. Cl.[5] F02M *69/46*

U.S. Cl. 123—531 **6 Claims**



1. A fuel injector adapted to be installed in an engine provided with a cylinder head, a combustion chamber situated below the cylinder head, a plurality of intake ports in the cylinder head facing the combustion chamber, a branch where these intake ports divide, an intake manifold connected to the intake ports via the branch, intake valves which open and close the intake ports, and stems passing through the intake ports which support the intake valves on the cylinder head, said fuel injector comprising:

a fuel injector body situated between the branch and the intake manifold, and

a guide pipe having branched ends for ejecting fuel delivered from said fuel injector body near the stem of each intake valve.

5,150,692

SYSTEM FOR CONTROLLING AIR SUPPLY PRESSURE IN A PNEUMATIC DIRECT FUEL INJECTED INTERNAL COMBUSTION ENGINE

Douglass E. Trombley, Grosse Pointe; Steven D. Stiles, Clarkston; Kenneth J. Buslepp, Shelby Township, Macomb County, all of Mich., and Kenneth J. Buslepp, Shelby Township, Macomb County, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1991, Ser. No. 807,315

Int. Cl.[5] F02M *23/00*

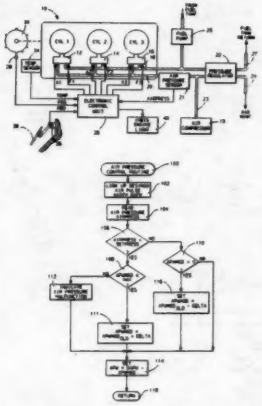
U.S. Cl. 123—533 **3 Claims**

1. A system for controlling pressure within a pressurized air supply for an engine having pneumatic direct fuel injection, wherein the pressurized air is utilized to inject fuel held within a fuel injector directly into an engine cylinder, against opposing cylinder compression pressure, while the injector is opened during a cylinder injection period in the engine cycle, the system comprising:

means for sensing the air supply pressure; and

means for adjusting the duration of the cylinder injection period in accordance with the sensed air supply pressure

to maintain the air supply pressure above the compression pressure in each cylinder during the cylinder injection



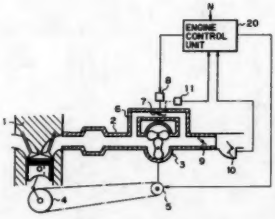
period, thereby preventing the backflow of fuel through the cylinder fuel injector into the air supply system.

5,150,693

BOOST PRESSURE CONTROL SYSTEM FOR A SUPERCHARGED ENGINE

Hidemi Ohnaka; Masaaki Tanaka; Yuuichi Kato; Michio Furuhashi; Koichi Satoya, and Yasuhiro Ooi, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1991, Ser. No. 734,765
Claims priority, application Japan, Sep. 29, 1990, 2-262648
Int. Cl.[5] F02B *33/00*
U.S. Cl. 123—559.3 **8 Claims**



1. A boost pressure control system for an engine comprising:

a supercharger disposed at an inlet air passage of the engine and driven by said engine via a power transmission clutch, an operation of said supercharger being started or stopped by connecting or disconnecting said clutch;

an air bypass passage being connected, at one end thereof, to an inlet air passage upstream of the supercharger, and at the other end thereof, to an inlet air passage downstream of the supercharger;

an air bypass valve disposed in said air bypass passage and controlling an air flow through the air bypass passage in accordance with a degree of opening of the air bypass valve; and

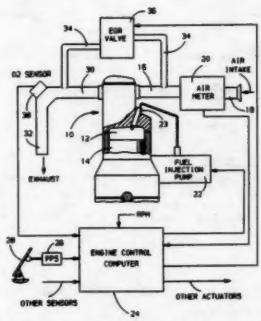
a bypass control means for controlling said air bypass valve by setting the degree of opening thereof to a value given as a function of an engine load, said function being selected by the bypass control means from among a plurality of predetermined functions in accordance with whether the operation of the supercharger is started or stopped.

5,150,694

DIESEL ENGINE CLOSED LOOP AIR/FUEL RATIO CONTROL

James H. Currie, Rochester; Richard A. Peden, Livonia; David P. Sczomak, Troy; Mark A. Mitchell, Dryden, and Michael J. Brown, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1991, Ser. No. 796,140
Int. Cl.[5] F02M *25/07*
U.S. Cl. 123—569 **2 Claims**



1. A method of controlling the air/fuel ratio in a diesel engine having an intake space coupled to atmosphere and from which air is drawn into cylinders of the engine, an exhaust passage into which exhaust gases are discharged from the cylinders, fuel injectors for injecting fuel into the cylinders to establish an air and fuel mixture to undergo combustion, and EGR means for recirculating a portion of the exhaust gases from the exhaust passage into the intake space, the EGR means including a valve operable between closed and full open for regulating the amount of exhaust gases recirculated, the method comprising the steps of:

sensing the air/fuel ratio of the cylinder air and fuel mixture;

storing (A) a first schedule of air/fuel ratio values as a predetermined function of a first engine operating condition and (B) a second schedule of air/fuel ratios as a predetermined function of a second predetermined engine operating condition;

controlling the fuel injectors to inject a fuel amount to each cylinder in accord with an operator fuel request;

determining if the EGR valve is closed;

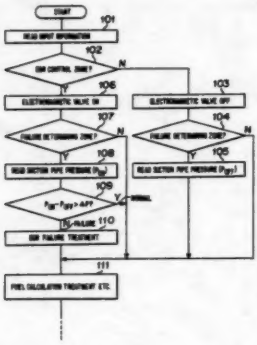
when the EGR valve is not closed, (A) sensing the second engine operating condition and (B) adjusting the EGR valve in direction to vary the amount of exhaust gases recirculated to restore the sensed air/fuel ratio to the air/fuel ratio in the second schedule corresponding to the sensed second engine operating condition; and

when the EGR valve is closed, (A) sensing the first engine operating condition, (B) determining if the sensed air/fuel ratio is rich or lean relative to the air/fuel ratio in the first schedule corresponding to the sensed first engine operating condition, (C) when the sensed air/fuel ratio is determined to be rich, decreasing the fuel amount injected by the injectors to restore the sensed air/fuel ratio to the air/fuel ratio in the first schedule corresponding to the sensed first engine operating condition, and (D) when the sensed air/fuel ratio is determined to be lean, increasing the fuel amount injected by the injectors to restore the sensed air/fuel ratio to the air/fuel ratio in the first schedule corresponding to the sensed first engine operating condition only when the operator fuel request is at a predetermined maximum.

5,150,695
ELECTRONIC CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Katsuhiko Kondo, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Apr. 8, 1991, Ser. No. 681,818
Claims priority, application Japan, May 22, 1990, 2-133060
Int. Cl.[5] F02M *25/07*
U.S. Cl. 123—571 **3 Claims**



1. An electronic control apparatus for an internal combustion engine comprising:

a control device having a control valve operative to control an amount of return of exhaust gas from an exhaust gas passage to a suction gas passage such that when said engine is in a predetermined control zone, said control valve is closed and when said engine is not in said predetermined control zone, said control valve is open;

a pressure sensor for detecting pressure in a suction gas pipe; and

a failure detecting means for passively detecting failure of said control device based on a difference between first and second pressure values in said suction gas pipe, said first pressure value being detected by said pressure sensor when said control valve is open, and said second pressure value being detected by said pressure sensor when said control valve is closed, wherein said first pressure value is stored in memory until said second pressure value is detected at which time said first and second pressure values are compared.

5,150,696
ADAPTIVE MEMORY CONTROL FOR NORMALIZED DILUTION

Daniel F. Kabasin, Rochester, and Donald D. Stoltman, Henrietta, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1991, Ser. No. 796,185
Int. Cl.[5] F02M *25/07*
U.S. Cl. 123—571 **8 Claims**

1. An apparatus for controlling an air-fuel ratio in an internal combustion engine equipped with an intake manifold, comprising:

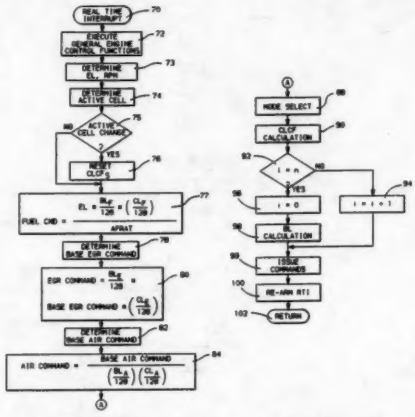
means for delivering a quantity of fuel to the engine;

means for sensing the air-fuel ratio in the engine;

means for recirculating a quantity of exhaust gas into the intake manifold of the engine when operating in a predetermined engine operating region;

means responsive to the sensed air-fuel ratio to adjust the quantity of exhaust gas recirculated into the intake manifold of the engine in response thereto when operating in the predetermined engine operating region in direction to maintain the air-fuel ratio at a predetermined air-fuel ratio; and

means responsive to the sensed air-fuel ratio to adjust the

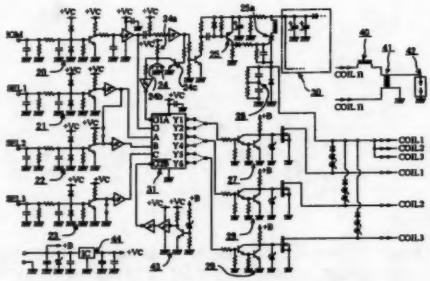


quantity of fuel delivered to the engine in response thereto when operating in a region other than the predetermined engine operating region in direction to maintain the air-fuel ratio at the predetermined air-fuel ratio.

5,150,697
IGNITION SYSTEM

Motonobu Akagi; Nobuyuki Oota, and Yasutoshi Yamada, all of Aichi, Japan, assignors to Aisin Seiki K.K., Kariya, Japan

Filed Mar. 29, 1991, Ser. No. 677,062
Claims priority, application Japan, Mar. 29, 1990, 2-83633
Int. Cl.[5] F02P *3/12*
U.S. Cl. 123—643 **11 Claims**



1. An ignition system for an automobile comprising:

a spark circuit;

a power supply circuit including a capacitor for supplying power;

a switching circuit operable for supplying power from said power supply circuit to said spark circuit;

a distributing circuit for controlling said switching circuit in accordance with an ignition timing signal; and

a control circuit, coupled to receive the ignition timing signal, said control circuit operable for providing a disabling control signal which disables said distributing circuit for a predetermined period of time in accordance with a first value of said ignition timing signal so that said switching circuit does not supply power from said power supply circuit to said spark circuit during the predeter-

mined period of time, said control circuit also being coupled to said power supply circuit for charging said capacitor during the predetermined period of time when said distributing circuit is disabled.

5,150,698

METHOD AND ARRANGEMENT FOR ADJUSTING FUEL FOR EMERGENCY OPERATION

Rolf Kohler; Alfred Kratt, both of Schwieberdingen, and Klaus Franzke, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

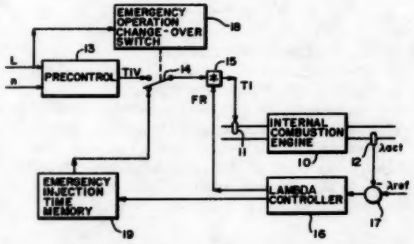
PCT No. PCT/DE89/00635, § 371 Date Apr. 15, 1991, § 102(e) Date Apr. 15, 1991, PCT Pub. No. WO90/04092, PCT Pub. Date Apr. 19, 1990

PCT Filed Oct. 5, 1989, Ser. No. 671,879

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835282

Int. Cl.[5] F02D *41/72, 41/34, 41/78*

U.S. Cl. 123—690 **11 Claims**



1. A method for setting the amount of fuel to be metered to an internal combustion engine having a lambda controller and an idling contact during normal operation as well as during emergency operation wherein the load signal, which coacts during normal operation for determining the amount of fuel, is not available, and for the condition of non-idle operation and with the lambda probe in operational readiness, the method comprising the steps of:

predetermining at least one emergency injection time;

forming an output variable of a lambda controller from the difference between the lambda actual value and a lambda desired value;

modifying each emergency injection time with the output variable of the lambda controller thereby forming an emergency injection time duration having a width dependent upon a selected maximum amplitude of said output variable;

selecting the number of emergency injection time durations and maximum amplitude of said output variable so as to cause the emergency injection time durations to cover all injection times which can occur during the operation of the engine; and,

in the case of the presence of at least two emergency injection times extending over respective time spans with said time spans having respective ends, if one of the ends of the time span associated with the emergency injection time actually present is reached, switching over to the next time span lying in the direction of said one of said ends.

5,150,699

COMPOUND BOW

Mathew G. Boissevain, 27181 Sherlock Rd., Los Altos, Calif. 94022

Filed Nov. 22, 1989, Ser. No. 441,049

Int. Cl.[5] F41B *5/00*

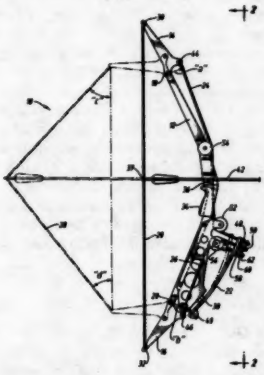
U.S. Cl. 124—25.6 **16 Claims**

1. An archery bow which is supported by one hand of an archer and moved from a braced position to a drawn position and maintained in the drawn position prior to release by the other hand of the archer, comprising:

a central handle section;

first and second arms pivotally coupled to opposite ends of the handle section;

a spring mounted to the handle section, the spring having connection locations; and



first and second members, one end of each of the first and second members being connected to the spring at the connection locations, the other end of the first member being connected to the first arm and the other end of the second member being connected to the second arm, such that when the arms are pivoted from a braced position toward a drawn position, the spring is deformed and exerts a restoring force on the arms through the members to return the arms toward the braced position.

5,150,700

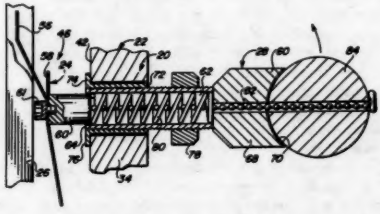
ARCHERY BOW ASSEMBLY

Vincent F. Troncoso, Montrose, Colo., assignor to Golden Key Futura, Inc., Montrose, Colo.

Filed Aug. 13, 1991, Ser. No. 744,270

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—44.5 **6 Claims**



1. An improved archery bow assembly comprising, in combination:

a) an archery bow comprising a pair of spaced limbs interconnected by a bowstring and by a handle riser having an about vertical sidewall and an about horizontal shelf defining an arrow window; and,

b) an archery arrow rest having an archery arrow releasably disposed thereon, said rest being disposed in said window by a transverse plunger extending through said sidewall above said shelf, said plunger including

i. an elongated tubular housing having a central cavity

extending therethrough and having an expanded head on the side of said bow away from said window, said head having a generally dish-shaped recess on the free end thereof,

i.i. a transverse rod releasably connected to said arrow rest and passing into said cavity,

i.i.i. a spring trapped in said cavity between said rod and said head and biasing said rod and rest towards said window,

i.i.i.i. an enlarged weight with a curved surface seated in said recess, said weight projecting latterally of said head, and

v. tether means in said cavity interconnecting said rod and weight, whereby said rest, rod and weight are biased by said spring into a resting position with said rest away from said sidewall in said window, said weight during shooting of said arrow from said bowstring being activated by the resultant bow vibration to move forward ,rotating out of said recess, thus drawing along with it said rest and rod toward said sidewall against said spring bias, for improved clearance of said arrow during its flight through said window, said weight, rod and rest thereafter returning to said resting position , due to said spring bias.

5,150,701

AIR GUN WITH ROTARY MAGAZINE

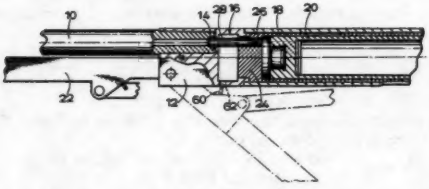
Roger D. Wackrow, Redditch; Kenneth W. White, Solihull, and Harold C. Jones, Studley, all of England, assignors to B.S.A. Guns (UK) Limited, Great Britain

Filed May 3, 1991, Ser. No. 695,211

Claims priority, application United Kingdom, May 5, 1990, 9010201; Sep. 17, 1990, 9020238

Int. Cl.[5] F41B *11/00*

U.S. Cl. 124—67 **6 Claims**



1. An air gun comprising an exchangeable magazine arranged to hold a plurality of pellets for loading one at a time into a breech of the gun, the magazine comprising:

(a) a carrier located in the gun adjacent to the breech;

(b) a drum which is rotatably mounted on the carrier and presents a plurality of pellet-holding slots distributed around its rotational axis;

(c) a drive spring acting between the drum and the carrier to rotate the drum to bring the slots successively into alignment with the breech for insertion of pellets into the breech; and

(d) an escapement mechanism acting between the drum and the carrier to arrest rotation of the drum by the drive spring and operable intermittently to release the drum for rotation in indexing steps; and the gun comprising also:

(i) a reciprocable loading ram adapted to be driven longitudinally into an aligned one of said slots in the drum to drive a pellet from the drum and into the breech;

(ii) escapement-actuating means; and

(iii) cocking mechanism operable in a cocking action to cock the gun for firing and being operatively associated with said loading ram for causing reciprocating of the ram and being operatively associated with said escapement-actuating means for causing operation of said escapement mechanism subsequently in the cocking action to withdrawal of the loading ram from the drum.

5,150,702

IRIS DIAPHRAGM DEVICE AND ENDOSCOPE HAVING THE SAME

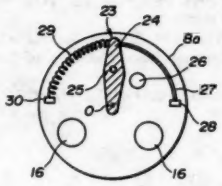
Hirofumi Miyanaga; Nobuyuki Sakamoto; Koichi Yoshimitsu, all of Tokyo, and Yasundo Tanaka, Urawa, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1991, Ser. No. 677,191

Claims priority, application Japan, Jun. 18, 1990, 2-160485; Jan. 17, 1991, 3-4019

Int. Cl.[5] A61B *1/06;* **G03B** *9/02;* **H04N** *5/238*

U.S. Cl. 128—6 **27 Claims**



1. An iris diaphragm device comprising:

iris diaphragm means which is displaced so as to change the diameter of a diaphragm aperture;

operating means including a shape-memory material which is deformed in accordance with temperatures, so as to displace said iris diaphragm means; and

temperature changing means for changing the temperature of said shape-memory material of said operating means.

5,150,703

LIQUID SHIELD VISOR FOR A SURGICAL MASK WITH A BOTTOM NOTCH TO REDUCE GLARE

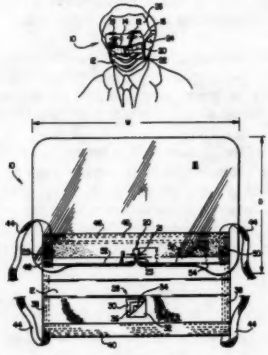
Vance M. Hubbard, and Welton K. Brunson, both of Bedford, Tex., assignors to Tecnol Medical Products, Inc., N. Richland Hills, Tex.

Continuation of Ser. No. 268,558, Nov. 8, 1988, Pat. No. 5,020,533, which is a continuation-in-part of Ser. No. 104,807, Oct. 2, 1987, Pat. No. 4,920,960. This application Feb. 25, 1991, Ser. No. 661,435

The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.

Int. Cl.[5] A62B *18/00, 18/02;* **A61F** *9/04*

U.S. Cl. 128—206.12 **10 Claims**



1. A liquid shield to protect the eyes, nose and mouth of a wearer, comprising:

a fluid impervious transparent visor for being affixed over the eyes of the wearer to protect the eyes from liquids directed from exterior said visor;

a notch in the lower portion of said visor to allow said visor to gradually bend and approximately conform to the face of the wearer without causing creasing of said visor; and

a mask connected to said visor for covering the mouth and nose of the wearer, said mask impervious to liquids from exterior said mask and comprising a first layer means of a material for slowing the velocity of the liquid therethrough, a second layer means of a material applied to said first layer means, said second layer means being pervious to gases to allow breathability by the wearer through the mask, and substantially impervious to the passage of liquids external of the mask for preventing the passage of liquids through the mask into the portion of the face of the wearer covered by the mask, a third layer means of a nonwoven fabric applied to said second layer means to prevent wicking of liquid through said second layer means to be the face of the wearer, and means for removably attaching the mask to the face of the wearer.

5,150,704

LASER THERAPEUTIC APPARATUS

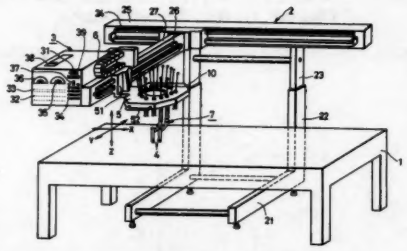
Tsuneo Tatebayashi; Yoshio Uno, and Masaichi Hiei, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 64,651, Jun. 22, 1987, abandoned. This application May 18, 1989, Ser. No. 355,103

Claims priority, application Japan, Jun. 23, 1986, 61-146680; Jul. 15, 1986, 61-165890; Jul. 15, 1986, 61-165891; Jul. 15, 1986, 61-165892; Jul. 15, 1986, 61-165893; Jul. 15, 1986, 61-165894; Jul. 24, 1986, 61-174091; Jan. 9, 1987, 62-2702

Int. Cl.[5] A61N *5/06*

U.S. Cl. 128—395 **21 Claims**



1. A laser therapeutic apparatus comprising:

a power supply for supplying power;

a plurality of laser probes operatively coupled to said power supply and selectively activated to convert the power to beam radiation;

control means operatively coupled to said laser probes for selecting an irradiation time and an irradiation output for each of said laser probes and for controlling activation of said laser probes in accordance with the selected irradiation times and irradiation outputs;

a probe support table having a rigid substantially planar surface to which each of said laser probes is movably coupled so that said laser probes are movable in two dimensions, said probe support table selectively positioning and supporting said plurality of laser probes in spaced relation; and

positioning means coupled to said probe support table for selectively positioning said probe support table.

5,150,705

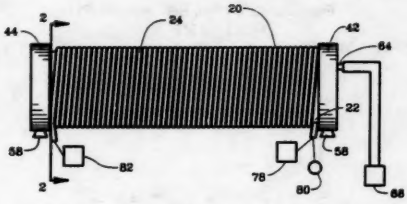
APPARATUS AND METHOD FOR IRRADIATING CELLS

Randy L. Stinson, 42 Glen Way, Baltimore, Md. 21236

Filed Jul. 12, 1989, Ser. No. 378,994

Int. Cl.[5] A61N *5/00*

U.S. Cl. 128—396 **28 Claims**



1. An apparatus for subjecting cells to irradiation by an ultraviolet light source comprising:

an ultraviolet light source;

an outer cylinder surrounding said light source;

carrying means separate from and encircling an outer peripheral surface of said outer cylinder for carrying suspended cells that are to be subjected to irradiation by the light source; and

means for ensuring that suspended cells within said carrying means are subjected to light from said light source having a wavelength equal to or greater than about 280 nanometers.

5,150,706

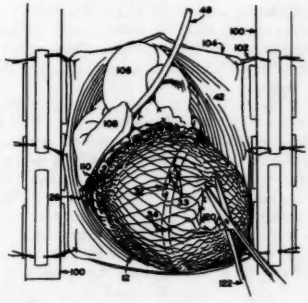
COOLING NET FOR CARDIAC OR TRANSPLANT SURGERY

James L. Cox, 7 Dromara Rd., Ladue, Mo. 63124, and Robert D. B. Jaquiss, 465 Fourwynd, Creve Coeur, Mo. 63141

Filed Aug. 15, 1991, Ser. No. 745,519

Int. Cl.[5] A61F *7/00*

U.S. Cl. 128—400 **13 Claims**



1. A device for cooling an internal organ during surgery, comprising:

a. a net made of a water-permeable fabric having a size and shape that allow the net to be fitted in a conforming manner around at least a portion of the organ; and

b. a conduit having (1) an inlet adapted to be coupled to a source of a chilled liquid during use, and (2) at least one outlet for the chilled liquid to exit the conduit,

wherein, when the net is in use during surgery, at least one outlet of the conduit is in fluid communication with the fabric of the net and positioned in a manner which directs chilled liquid exiting the conduit through said outlet into the fabric of the net, thereby causing the liquid to permeate into and diffuse

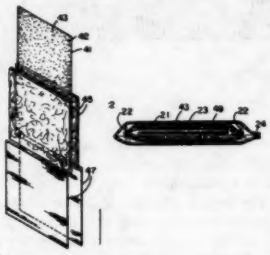
through the fabric of the net so that the chilled liquid will contact the surface of the organ.

5,150,707

ABSORBENT ASSEMBLY FOR USE AS A THERMAL PACK

Leslie B. Anderson, Easton, Pa., assignor to Medico International, Inc., Palmer, Pa.

Filed Jun. 18, 1990, Ser. No. 539,841
Int. Cl.[5] A61F *7/00*
U.S. Cl. 128—402 **20 Claims**



1. A hot/cold compress for application to an afflicted body portion comprising at least two thermal packs and a holder having at least two pockets disposed side-by-side for receiving said thermal packs, at least one in each pocket, and a strap adapted to encircle said body portion attached at one end to one by said pocket and having releasable fastening means to releasably engage said holder adjacent said pockets,

each said thermal pack comprising an absorbent assembly of hydrophilic material comprising a carrier film having a layer of water-soluble adhesive material on at least one surface thereof, a layer of hydrophilic particulate material adhered to said carrier film by said adhesive layer, said particulate hydrophilic material operable upon contact with water to expand in the form of a gel,

said carrier film and said particulate material adhered thereto forming the central layer of a multi-layer package, the outer layers of said multi-layer package comprising porous material having flow passages therethrough of a size sufficiently large to afford migration of water through the pores from outside the package into the central layer, and vice versa, and sufficiently small to restrict migration of the gel from the central layer outwardly through the outer layers,

said outer layers having a seam extending around their periphery to form a hollow enclosure surrounding said carrier film, said hollow enclosure adapted to be expanded to accommodate the expansion of said particulate material caused by forming a gel upon contact with water, whereby upon contacting said assembly with water, water migrates through said outer layers into said enclosure to cause said particulate matter to form a gel and also to dissolve the adhesive material to free said particulate matter and the gel from adherence to said carrier film.

5,150,708

TABBED DEFIBRILLATOR ELECTRODE PAD

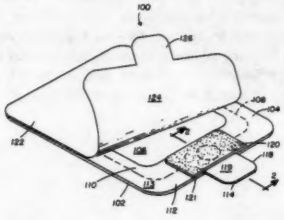
Robert J. Brooks, Everett, Wash., assignor to SpaceLabs, Inc., Redmond, Wash.

Filed Dec. 3, 1990, Ser. No. 621,863
Int. Cl.[5] A61N *01/04*
U.S. Cl. 128—419 D **26 Claims**

1. An electrode for conducting electricity between medical apparatus and the body of a patient, said electrode comprising:

electrode pad means for conducting electricity to the body of the patient, said electrode pad means including an application surface having a periphery wherein a portion of said application surface includes electrode means for conducting electricity from said electrode pad means to the body of the patient, said electrode pad means further including adhesive means disposed upon said application surface of said electrode pad means for adhering said electrode pad means to the body of the patient, said electrode pad means including gripping means for providing a gripping edge to a user of the electrode, said gripping means including a gripping surface that is accessible to the user to provide the gripping edge; and

release sheet means for covering said application surface of said electrode pad means to prevent said adhesive means



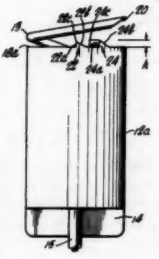
from unintentionally sticking to objects other than the body of the patient, said release sheet means including means for substantially preventing said adhesive means from sticking to said release sheet means so that said release sheet means is easily removable from said electrode pad means, said release sheet means further including a tab portion constructed to extend beyond the periphery of said electrode pad means to provide an opposing gripping edge, opposite said gripping edge of said gripping means, to permit a user to remove said release sheet means from said electrode pad means.

5,150,709

SPIRAL ELECTRODE WITH CONTACT RETAINER

Theodore C. Neward, P.O. Box 725, Cucamonga, Calif. 91730

Filed Feb. 11, 1991, Ser. No. 654,268
Int. Cl.[5] A61B *5/0448*
U.S. Cl. 128—642 **19 Claims**



1. An electrode structure for use in fetal heart monitoring comprising

a substantially cylindrical electrode body formed of electrically insulating material and having a first end and a second end,

a spiral electrode extending from the first end of the body and terminating in a pointed end adapted to pierce a fetal epidermal layer,

a second electrode extending from the second end of the electrode body, said second electrode being electrically insulated from the spiral electrode, and

the first end of the electrode body having at least a protru-

sion underlying a portion of the spiral electrode to increase the resistance of the electrode structure from unwinding from the fetal epidermal layer.

5,150,710

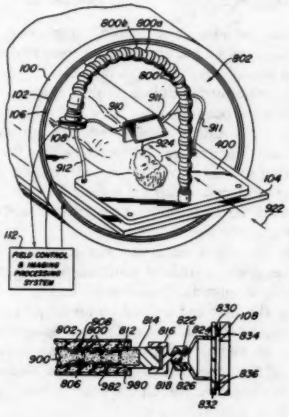
VARIABLE POSITION SURFACE COIL STABILIZER FOR MAGNETIC RESONANCE IMAGING

Bradford D. Hall, Fairless Hills, and Steven B. Krupnick, Philadelphia, both of Pa., assignors to Webb Research II, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 342,232, Aug. 21, 1989, abandoned. This application Feb. 22, 1990, Ser. No. 483,244

Int. Cl.[5] A61B *5/055*

U.S. Cl. 128—653.5 1 Claim



1. In a magnetic resonance imagining system, a coil assembly comprising a surface coil, a portable base and support means for permitting said coil to be translated along any one of three orthogonal directions and to be rotated about any one of three orthogonal axes with respect to said base upon the application of a force, and for arresting the position of said coil upon removal of said force, said support means being a segmented joint assembly comprising a plurality of non-metallic, tubular segmented joint members connected together end-to-end, whereby said segmented joint assembly has a tubular interior extending along its length, each of said segmented joint members having a hollow skirt portion and a ball portion removably held in the skirt portion of an adjacent one of said segmented joint members, a powder filling said tubular interior for increasing the resistance between the ball and skirt portions of adjacent segmented joint members, whereby to increase the force required to move said ball portions with respect to said skirt portions.

5,150,711

ULTRA-HIGH-SPEED EXTRACORPOREAL ULTRASOUND HYPERTHERMIA TREATMENT DEVICE

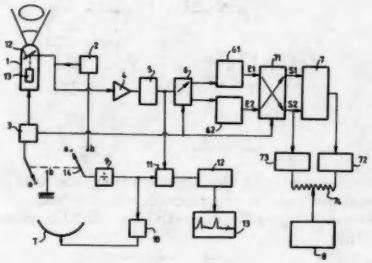
Jacques Dory, Coupvray, France, assignor to EDAP International, S.A., France

Continuation-in-part of Ser. No. 696,992, May 3, 1991, which is a continuation of Ser. No. 427,429, Oct. 27, 1989, Pat. No. 5,054,255, which is a continuation-in-part of Ser. No. 368,906, Jun. 19, 1989, Pat. No. 5,080,101, which is a continuation of Ser. No. 37,369, Apr. 13, 1987, abandoned, which is a division of Ser. No. 728,905, Apr. 30, 1985, Pat. No. 4,658,828, which is a continuation-in-part of Ser. No. 674,889, Nov. 26, 1984, Pat. No. 4,617,931. This application Jul. 23, 1991, Ser. No. 734,667

Claims priority, application France, Jul. 23, 1990, 90 09717

Int. Cl.[5] A61B *8/00*

U.S. Cl. 128—660.03 8 Claims



1. In an extracorporeal ultrasound hyperthermia target treatment device comprising:

a) means generating a treatment beam from an emitting surface; and means locating a treatment beam target in a body;

b) means aiming and focusing said beam at said target at a focal spot; the improvement comprising:

c) in said treatment beam generating means means for producing ultrasound wave trains at frequencies between about 1 MHz and about 6 MHz, as a function of frequency; and peak electric powers between about 10 KW and 1 KW, as a function of frequency; and peak acoustic powers between about 3 KW and 200 watts, as a function of frequency; which produce acoustic intensity at the focal spot between about 100 KW and 10 KW per square centimeter, as a function of frequency, for less than about three seconds.

5,150,712

APPARATUS FOR EXAMINING AND LOCALIZING TUMORS USING ULTRA SOUNDS, COMPRISING A DEVICE FOR LOCALIZED HYPERTHERMIA TREATMENT

Jacques Dory, Coupvray-Esbly, France, assignor to EDAP International, S.A., France

Division of Ser. No. 352,516, May 16, 1989, which is a division of Ser. No. 37,369, Apr. 13, 1987, abandoned, which is a division of Ser. No. 728,905, Apr. 30, 1985, Pat. No. 4,658,828, which is a continuation-in-part of Ser. No. 674,889, Nov. 26, 1984, Pat. No. 4,617,931. This application Jan. 9, 1991, Ser. No. 638,961

Claims priority, application France, Dec. 14, 1983, 83 20041; May 3, 1984, 84 06877

Int. Cl.[5] A61B *8/00;* A61N *5/00*

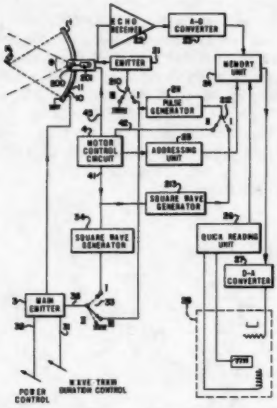
U.S. Cl. 128—660.03 14 Claims

1. An article of manufacture comprising:

(a) a concave focusing treatment wave transducer assembly for treating a target and a plurality of mounted juxtaposed piezoelectric elements, and

(b) separate target locating and treatment aiming ultrasound transducer means adapted to be positioned between a focal point of said treatment wave transducer assembly

and said target for scanning said target with echographic ultrasound and for generating a target image;
(c) means displaying said image of said target;



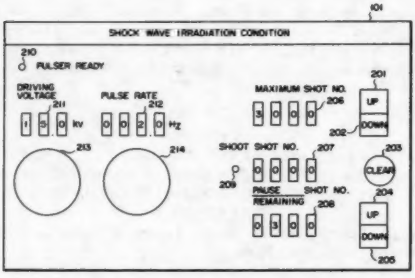
(d) means displaying a visible indication of said focal point of said treatment wave transducer assembly; and
(e) means bringing said image and said indication into coincidence.

5,150,713

METHOD AND SYSTEM FOR CONTROLLING SHOCK WAVE IRRADIATION IN A SHOCK WAVE THERAPY APPARATUS

Kiyoshi Okazaki, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 20, 1990, Ser. No. 569,909
Claims priority, application Japan, Aug. 21, 1989, 1-212942
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—660.03 **24 Claims**



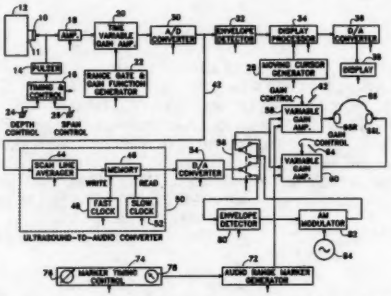
1. A system for controlling shock wave irradiation in a shock wave therapy apparatus, the system comprising:
acquiring means for acquiring an ultrasound tomogram image of a subject;
displaying means for displaying the acquired ultrasound tomogram image to detect a portion to be irradiated within the subject.
irradiating means for irradiating shock waves to the detected portion;
first setting means for setting a maximum number of irradiations of the shock waves;
second setting means for setting a number of pause irradiations of the shock waves; and
controlling means for controlling the irradiating means in accordance with the maximum number of irradiations of the shock waves and the number of pause irradiations of the shock waves to irradiate the shock waves to the detected portion during a plurality of irradiation periods determined by the maximum number of irradiations of the shock waves and the number of pause irradiations of the shock waves.

5,150,714

ULTRASONIC INSPECTION METHOD AND APPARATUS WITH AUDIBLE OUTPUT

Philip S. Green, Redwood City, Calif., assignor to SRI International, Menlo Park, Calif.

Filed May 10, 1991, Ser. No. 698,723
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—660.06 **25 Claims**



1. An ultrasonic inspection method employing reflections from discontinuities within an object of recurrent transmitted pulses of ultrasonic energy comprising:
recurrently transmitting pulses of ultrasonic energy into an object along a beam axis,
receiving by transducer means reflected ultrasonic wave pulses from over a range of distances within the object and converting the same to ultrasonic electrical signals,
converting ultrasonic electrical signals from the transducer means received during at least a portion of said range to an audio frequency signal,
converting the audio frequency signal to first and second audio frequency signals of simultaneously increasing and decreasing amplitude, respectively, and
converting the first and second audio frequency signals to audible signal form at first and second spaced locations to provide an audible presentation having a stereophonic spatial effect dependent upon distance of travel of the reflected ultrasonic wave pulses for an audible indication of depth of reflections.

5,150,715

ULTRASOUND-IMAGING DIAGNOSTIC SYSTEM

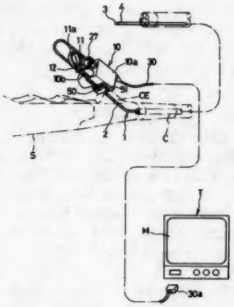
Masaaki Ishiguro; Toshizumi Tanaka, and Yukio Takagi, all of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Apr. 10, 1991, Ser. No. 683,295
Claims priority, application Japan, Apr. 18, 1990, 2-100395; Apr. 18, 1990, 2-100396; Apr. 18, 1990, 2-100397
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—662.06 **6 Claims**

1. An ultrasound imaging system, comprising:
an ultrasound probe having an elongated flexible body rotatably supporting an ultrasound transducer on a tip end portion;
an operating unit including means for scanning said ultrasound probe;
a flexible cord having one end thereof securely fixed to said

operating unit and the other end detachably connected to an ultrasound image observation terminal;

a rotary connector comprising a rotatable member having at least one rotatable electrode, a fixed member having at least one fixed electrode, and a fluid contact interposed between said rotatable and fixed members to electrically connect said rotatable and fixed electrodes with each other; and



a cable having a rotatable cable portion one end being fixedly wired to said ultrasound transducer and another end being detachably coupled with said rotatable member of said rotary connector, and a non-rotatable cable portion one end being fixedly wired to said fixed member of said rotary connector and a connector to be connected with said ultrasound image observation terminal.

5,150,716

SYSTEM FOR DIAGNOSIS AND STAGING OF DEMENTIA BY NEUROLOGIC EXAMINATION

Emile Franssen, 595 Main St., and Barry Reisberg, 20 Waterside Plz. #7K,, New York, N.Y. 10010

Filed Jan. 28, 1991, Ser. No. 646,688

Int. Cl.[5] A61B *5/103*

U.S. Cl. 128—774 11 Claims

1. The process for developing cognition independent tests for the diagnosis and staging of dementia comprising

(a) separation of cognition-dependent measures from the clinical neurologic examination

(b) selecting a group of cognition-independent measures from the clinical neurologic examination, more specifically, reflex phenomena, for the purpose of diagnosing and staging dementia

(c) developing and modifying scoring methodology of cognition-independent clinical measures, specifically, reflexes

(d) developing new neurologic measurements from specific combinations of individual quantified neurologic measurements, that is, from reflexes

(e) utilizing these quantified individual clinical neurologic measurements as well as the combination neurologic quantified measurements to diagnose and stage dementia.

5,150,717

MICROWAVE AIDED BALLOON ANGIOPLASTY WITH GUIDE FILAMENT

Arye Rosen, 508 Heartwood Rd., Cherry Hill, N.J. 08003, and Paul Walinsky, 220 E. Mermaid La., Philadelphia, Pa. 19118

Division of Ser. No. 269,960, Nov. 10, 1988, abandoned. This application Sep. 18, 1990, Ser. No. 584,061

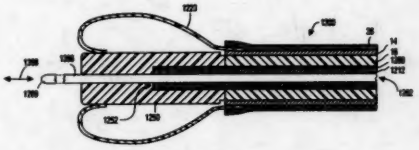
Int. Cl.[5] A61B *17/36*

U.S. Cl. 128—804 19 Claims

1. A flexible filament guided microwave catheter, comprising:

an elongated flexible tube defining a longitudinal bore, a distal and a proximal end, at least the outer portion of said tube being electrically conductive;

an elongated electrically conductive flexible sheath surrounding and spaced away from the exterior of said tube over at least a portion of its length to thereby define a coaxial electromagnetic transmission line including proximal and distal ends;



a flexible guide filament slideably disposed within said bore;

applying means for applying microwave power through said transmission line;

antenna means coupled to at least said conductive portion of said tube at said distal end, for radiating in response to said microwave power.

5,150,718

METHOD OF CONTRACEPTION

Hendrik De Nijs, Oss, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 541,559, Jun. 21, 1990, Pat. No. 5,088,505, Division of Ser. No. 229,066, Aug. 5, 1988, Pat. No. 4,957,119. This application Feb. 14, 1992, Ser. No. 836,632

Int. Cl.[5] A61K *9/22*

U.S. Cl. 128—832 8 Claims

1. A method of contraception comprising: subcutaneously or locally administering an implant said implant comprising:

core material of ethylene/vinyl acetate copolymer having such a molecular weight that the melt index is equal to or greater than 10 grams/10 minutes, and a vinyl acetate content of at least 20% by weight, which core material functions as a matrix for at least one highly active progestogen present in a quantity sufficient for a release rate of greater than 30 μg of said progestogen per day over a term of at least one year, and

a membrane having a layer thickness of 50–250 μm which encases the core material and also consists of ethylene/vinyl acetate copolymer, but with such a molecular weight that the melt index is less than or equal to 10 grams/10 minutes, and a vinyl acetate content of less than 20% by weight, which membrane, with the core material, forms a contact layer at the interface of the core material and membrane thus preventing the core material and membrane, from separating from one another.

5,150,719

APPARATUS AND METHOD FOR REMOVING TOBACCO SHREDS FROM A CIGARETTE FILTER

Wayne B. Adkins, New Kent, and Jose I. Roncero, Richmond, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Feb. 19, 1991, Ser. No. 657,523

Int. Cl.[5] A24C *5/36*

U.S. Cl. 131—96 28 Claims

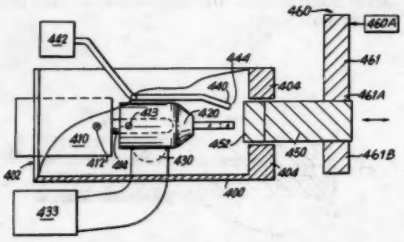
1. Apparatus for removing tobacco shreds from an end of a filter material in a severed filter portion of a smoking article, comprising:

means for gripping the severed filter portion and means for maneuvering the severed filter portion to a selected location so that a filter material tobacco end is presented to a deshredding area in the selected location;

means for maintaining the filter portion at the selected location for a period of time;

a deshredder tool for contacting and loosening tobacco shreds, said tool being located proximate to the selected location so that the filter material is a preselected distance from said tool; and

means for directing a stream of gas at the selected location to loosen and remove tobacco shreds.



5,150,720

CUBOIDAL PACK, ESPECIALLY HINGE LID PACK FOR CIGARETTES

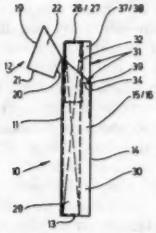
Heinz Focke, Verden, and Hans-Jürgen Bretthauer, Bremen, both of Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Feb. 20, 1991, Ser. No. 658,013

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1990, 4005443

Int. Cl.[5] A24F *15/00*

U.S. Cl. 131—329 **4 Claims**



1. In a cuboidal hinge-lid pack made of thin cardboard and having a collar; said pack containing an interior cigarette block in the form of a group of cigarettes wrapped in a wrapper; said pack having a hinged lid (**12**), a pack rear wall (**11**) to which the lid is hinged, two pack side walls (**15, 16**), a bottom wall (**13**) and a pack front wall (**14**), all of which walls define an interior volume having a height, width and depth; said pack having a front wall-to-rear wall depth which is greater than that of the cigarette block, thereby forming in said pack a front cavity (**30**) having a depth and a width which is equal to the width of said volume the improvement wherein:

said front cavity is located in a front portion of the pack and is bounded by the pack front wall (**14**);

the collar (**24**) is formed from a blank of thin cardboard and is angularly folded in three dimensions to form in said front cavity (**30**) a filling piece which supports the cigarette block between the pack rear wall (**11**) and the filling piece;

the collar (**24**) comprises only a collar front wall (**25**), located in aid front collar (**30**) near said pack front wall (**14**), and collar side tabs (**26, 27**) abutting said pack side wall (**15, 16**), and has no rear wall, said collar front wall (**25**) and said collar side tabs (**26, 27**) extending around only an upper portion of the pack and around only said pack front (**14**) and side (**15, 16**) walls;

the collar (**24**) extends over the entire width of said front cavity (**30**); and

the folded collar comprises: in a lower portion of said collar front wall (**25**), a lower connecting tab (**33**) abutting, and secured to, the pack front wall (**14**); in an upper portion of said collar front wall (**25**), an upper upright supporting wall (**32**) for supporting the cigarette block, said upright supporting wall (**32**) being inwardly set back into the interior volume of the pack relative to said lower connecting tab (**33**); and a folding strip, interconnecting said upper upright supporting wall (**32**) and said lower connecting tab (**33**), and defining a step.

5,150,721

TOBACCO SMOKE FILTER MATERIAL AND PROCESS FOR PRODUCTION THEREOF

Benedict M. Lee, 1036 Hanover Ct., and James E. Harris, 2305 Norwich Pl., both of Kingsport, Tenn. 37660

Continuation-in-part of Ser. No. 486,322, Feb. 28, 1990. This application Oct. 10, 1990, Ser. No. 596,654

Int. Cl.[5] A24D *3/02*

U.S. Cl. 131—331 **7 Claims**

1. A process for preparing a tobacco smoke filter material comprising:

(a) dissolving about 5 to 32 wt. % of at least one acidic compound selected from nontoxic, nonvolatile organic acids, into cellulose acetate solution containing between about 1 and 15 wt. % water and about 35 to 75 wt. % acetone;

(b) adding the concentrate of (a) to an acetone spinning solution of cellulose acetate;

(c) spinning said solution into filaments; and

(d) combining said filaments to make filter tow.

5,150,722

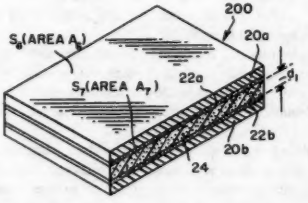
MULTI-LAYER SCENT EMITTING ARTICLE AND DEVICE ADAPTED TO EMPLOY SAME

Howard J. Rutherford, Highlands, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 407,064, Sep. 14, 1989, Pat. No. 5,069,231, which is a continuation-in-part of Ser. No. 379,175, Jul. 12, 1989. This application Nov. 9, 1990, Ser. No. 611,913

Int. Cl.[5] A24F *47/00*; B67D *5/10*; B32B *9/04*

U.S. Cl. 131—335 **9 Claims**



1. A multi-layer controlled release functional organoleptic material-emitting lamina article comprising:

(a) a controlled release functional organoleptic material-emitting substantially planar core lamina consisting of a microporous or macroporous polymer having included in the pores thereof a functional organoleptic material composition, said core lamina having a first upper planar surface S_1 of surface area A_1, a second lower planar surface, S_1', of surface area A_1', a substantially uniform finite cross section thickness d_1 and a lateral continuous or discretely interrupted surface area S_e having an area A_e which surface area A_e is exposed to the environment surrounding the article, being substantially in linear lateral

core planes, immediately adjacent or conterminous to and juxtaposed to one another or in a curvilinear lateral core plane or in curvilinear lateral core planes immediately adjacent or conterminous to and juxtaposd to one another, said lateral core plane or core planes being substantially perpendicular to said first upper planar surface and said second lower planar surface of said core lamina wherein:

$$A_1=A_1'>>>A_e$$

and;

$$S_e\perp (S_1 \wedge S_1')$$

(b) fixedly adhered to said first upper planar surface of said core lamina and contiguous or coplanar therewith at least one planar impermeable polymeric first barrier lamina or series of monoplanar spaced parallel first barrier laminae which has a first upper surface S_2 of surface area A_2 and a second lower surface S_3 of surface area A_3, said second lower surface being fixedly contiguous or coplanar with said first upper planar surface of said core lamina with the provisos that:

$$A_1=A_1'\cong A_3\cong A_2$$

and;

$$S_1 \parallel S_1' \parallel S_3 \parallel S_2$$

(c) fixedly adhered to said lower planar surface S_1' of said core lamina and contiguous or coplanar therewith at least one planar impermeable polymeric second barrier lamina or a series of spaced parallel second barrier laminae which has a first upper surface S_4 or surface area A_4 and a second lower surface S_5 of surface area A_5, said first upper surface S_4 being fixedly contiguous or coplanar with said second lower planar surface S_1 of the core lamina with the provisos that:

$$A_1'\cong A_4\cong A_5$$

and;

$$S_1' \parallel S_4 \parallel S_5.$$

5,150,723

PROCESS FOR THE PRODUCTION OF TOBACCO SMOKE FILTERS

Benedict M. Lee, and James E. Harris, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 250,690, Sep. 28, 1988, Pat. No. 4,964,426. This application Jun. 8, 1990, Ser. No. 535,009

Int. Cl.[5] A24D *3/16*; C08B *3/06, 1/02*

U.S. Cl. 131—342 **11 Claims**

1. A process for preparing a tobacco smoke filter material comprising the steps of:

(a) immersing a fibrous or sheet tobacco smoke filter element having surfaces for exposure to tobacco smoke in a solution comprising a liquid and about 1 to about 50 weight percent of a compound capable of forming micro acicular crystals,

(b) removing the filter element from said solution to result in a filter element in contact with residual solution, and

(c) removing the liquid from said residual solution under conditions such that a tobacco smoke filter material is formed comprising said tobacco smoke filter element having micro acicular crystals of said compound present on said surfaces in an amount of at least about 1 weight percent, based on the weight of the filter material.

5,150,724

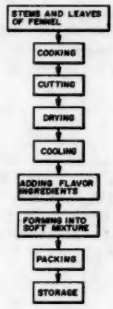
METHOD OF MAKING NON-NICOTINE CIGARETTES

Chien-Ching Liu, No. 103, Yi Hua St., Taichung, Taiwan

Filed Mar. 20, 1991, Ser. No. 672,565

Int. Cl.[5] A24B *15/00*

U.S. Cl. 131—359 **5 Claims**



1. A method for making a non-nicotine cigarette which comprises the steps of: providing the stems and leaves of a non-nicotine containing plant selected from the group consisting of fennel and *foeniculum vulgare* and mixtures thereof; comminuting the stems and leaves; and forming the comminuted stems and leaves into a cigarette.

5,150,725

FILTER TIPPED SMOKING RODS

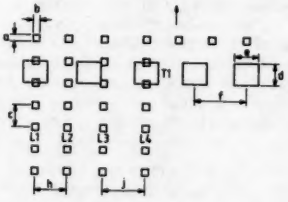
Linda J. Cunningham, Co. Down; Brian Adams, Templepatrick, and William Barham, Belfast, all of Ireland, assignors to Gallaher Ltd., England

Filed Feb. 13, 1991, Ser. No. 654,465

Claims priority, application United Kingdom, Feb. 13, 1990, 9003248

Int. Cl.[5] A24D *1/02*

U.S. Cl. 131—365 **23 Claims**



1. A tipped smoking rod comprising

a tobacco rod,

a filter tip adjacent one end of the tobacco rod and comprising a filter body enclosed within plugwrap material, and

a tipping overwrap material around the filter tip and the said adjacent end of the tobacco rod, and in this smoking rod,

the plugwrap material is selected from first and second sheet materials and the tipping overwrap material is the other of the first and second sheet materials,

the first sheet material is a substantially impermeable sheet material that has been provided with a first pattern of first perforations, and

the second sheet material is a substantially impermeable sheet material that has been provided with a second pattern of second perforations,

wherein the perforations are all between 0.01 and 1 mm in each dimension,

the first pattern comprises one or a plurality of parallel first rows of first perforations in a predetermined arrangement within each row,

the second pattern comprises one or a plurality of parallel second rows of second perforations in a predetermined arrangement within each row,

the first and second patterns are selected such that there is an area of overlap of first and second perforations that is at least 0.2 mm^2 and that is substantially unaffected by the relative positions of the tipping and the plugwrap materials.

5,150,726

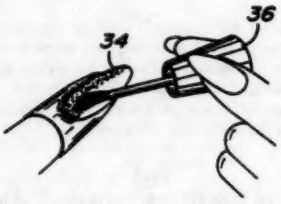
METHOD AND APPARATUS FOR APPLICATION OF FINGER & TOENAIL COATINGS

Joie Rucker, P.O. Box 215, Sausalito, Calif. 94965

Division of Ser. No. 166,395, Mar. 10, 1988, Pat. No. 4,960,587. This application Oct. 1, 1990, Ser. No. 591,423

Int. Cl.[5] B32B *3/02*

U.S. Cl. 132—285 **9 Claims**



6. A mask for releasably covering, sealing and protecting the cuticle and immediately adjacent skin tissue of a person's finger or toe during application of a coating to an associated finger or toenail, the mask comprising a flat U-shaped sheet of pliable, elastic and manually stretchable and formable synthetic resin material having an adhesive coated on one surface thereof for releasably adhering said mask to said cuticle and skin tissue and said U-shaped mask including flat, elastic and manually stretchable and formable opposing side means and base means between said side means for covering, sealing and protecting said cuticle and skin tissue and bounding a cut out open to a forward edge of said sheet and having a size and shape of said nail to expose said nail for coating while said elastic and stretchable side and base means are manually stetched and formed to cover said cuticle and skin tissue surrounding said nail with a marginal edge exactly fitting a border of said nail.

5,150,727

FALSE BOTTOM SUMP

Mark D'Amato, Montreal, Canada, assignor to D.E.M. Controls of Canada, Montreal, Canada

Filed Nov. 26, 1990, Ser. No. 617,693

Int. Cl.[5] B08B *3/02*

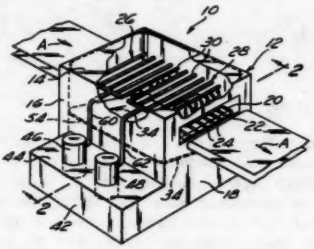
U.S. Cl. 134—104.2 **13 Claims**

1. A fluid baffle for use in facilitating recirculation of fluid discharged from a sprayer into a sump of a chemical processing machine for manufacturing printed circuit boards, the baffle being disposed within the processing machine between the spray and sump and being sized to substantially cover the sump so as to act as a barrier between the sprayer and sump, the baffle comprising:

an upper fluid contacting surface disposed at a sloped angle intermediate the sprayer and sump, the fluid contacting surface having an upper edge portion disposed proximate a sump pump, and a lower edge portion disposed distal to the sump pump; and

at least one opening formed in the fluid contacting surface adjacent the lower edge portion thereof;

wherein the fluid contacting surface is operative to receive fluid discharged from the sprayer and mix and aerate the fluid as the fluid is directed downwardly by the sloped



angle thereof towards the opening, were upon the fluid is drained into the sump distal the sump pump, thus preventing the settling and separation of particulate matter from the fluid within the sump due to the circulation of the fluid across the length of the sump before being pumped to the sprayer by the sump pump.

5,150,728

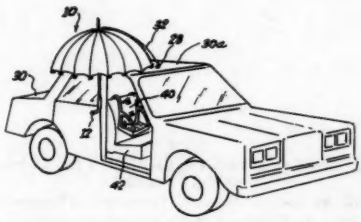
UMBRELLA WITH MAGNETIC FASTENERS

Catherine Stark, 431 Lake Helen Dr., West Palm Beach, Fla. 33411

Filed Aug. 20, 1991, Ser. No. 748,743

Int. Cl.[5] A45B *3/00*

U.S. Cl. 135—16 **2 Claims**



1. An umbrella that can be readily attached to a metallic magnetic surface such as found in an automobile comprising:

a fabric canopy;

a plurality of radially disposed supporting ribs attached to one side of said canopy;

a shaft operably connected to said radial ribs for moving said ribs from a first position to a second position causing the canopy to move from an open position to a closed position; and

magnetic fastening means strategically attached to at least one location on said umbrella for attachment to a metal magnetic surface, said magnetic fastening means includes a plurality of fabric pocket attached to said canopy, the plurality of magnetic fasteners strategically disposed and fastened in fabric pockets to said canopy;

wherein said umbrella is supported and held in place about the metal magnetic surface without being hand held by the user thus allowing the user to perform other functions while retaining the benefits of said umbrella.

5,150,729

CONTROL SPEAR FOR USE IN A PASSAGE FOR CONDUCTING DUST-CONTAINING HOT GASES

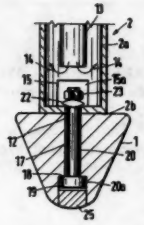
Wolfgang Frank, Eschborn; Johannes Löffler, Bad Homburg, and Norbert Holle, Friedrichsdorf, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 9, 1991, Ser. No. 774,021

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1990, 4036487

Int. Cl.[5] F16K *49/00*

U.S. Cl. 137—340 1 Claim



1. A control spear for a valve in a passage for conducting dust-containing hot gases, said valve closing and unclosing an opening in said passage, the control spear comprising a shaft and a frustoconical head movably mounted on the shaft, said head being made of ceramic material or hardened steel, said head cooperating with said opening to effect closing and unclosing of the valve, the shaft being hollow and being provided with means for a cooling liquid to flow therethrough, the shaft at its bottom end adjacent to the head being provided with a chamber, the head having a central bore and a shoulder within an enlarged portion of said bore, the bore containing a stressing bolt having an enlarged head bearing against said shoulder, one end of the stressing bolt extending from the head into the chamber, and a disk spring and a nut cooperating with the stressing bolt within said chamber, said spring being forced by the nut against the bottom end of the shaft.

5,150,730

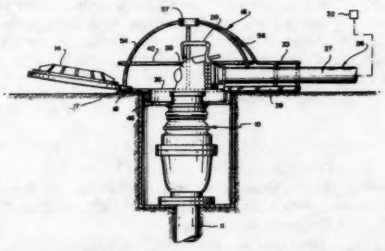
PROVISIONAL PROTECTIVE MEANS FOR PIT VALVE CASING

Teddy G. Campbell, Brookfield, Conn., assignor to Texaco, Inc., White Plains, N.Y.

Filed Mar. 2, 1992, Ser. No. 844,053

Int. Cl.[5] F16L *5/00*

U.S. Cl. 137—364 10 Claims



1. The combination with a pit valve casing embedded into the ground, having a ground level flange at the casing upper end, said casing enclosing a subsurface pit valve communicated with a source of liquid to be transferred, said pit valve having adapted to provisionally engage a connector having a liquid transfer hose depending therefrom, of

a protective enclosure for engagement with said ground level flange during a liquid transfer operation, and comprising:

a base plate having upper and under surfaces and means defining an access opening therethrough,

at least one deflector element depending from said base plate upper surface and extending transversely above said means forming said access opening, and

a hose deflector means depending laterally from said base to register about a segment of said liquid transfer hose adjacent to said connector.

5,150,731

BUTTERFLY VALVE TO PREVENT DEW CONDENSATION THEREFROM

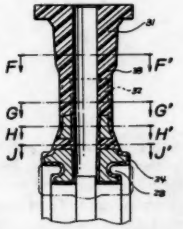
Kamezawa Jiro, Daito, Japan, assignor to Tomoe Technical Research Co., Japan

Filed Dec. 27, 1990, Ser. No. 634,398

Claims priority, application Japan, Jul. 20, 1990, 2-192663[U]

Int. Cl.[5] F16L *7/00*

U.S. Cl. 137—375 20 Claims



1. A butterfly valve for preventing dew condensation which comprises:

a valve body having a cylindrical flow passage therein;

a disk-like valve located rotatably in said valve body;

a seated ring formed with a sealing material, inserted between an inner surface of said valve body and an outer surface of said disk-like valve, and connected to said outer surface of said disk-like valve;

a pair of valve stems comprising a driving side and an idling side, which sides extend radially and in the opposite direction;

a pair of shaft cylinders for the driving side and the idling side which extend outside of said valve body and in opposite radial directions from said valve body;

an insulating cover applied on the external surface of said valve body and applied around said shaft cylinder for prevention of dew condensation;

a thermal conducting breaking part set on a part of said shaft cylinder of driving side; and

said thermal conducting breaking part being located on the outside of said insulating cover.

5,150,732

BOOSTED DIFFERENTIAL PRESSURE-TYPE TANK VALVE

Bruce A. Antunez, 1143 Indian Springs, Glendora, Calif. 91740

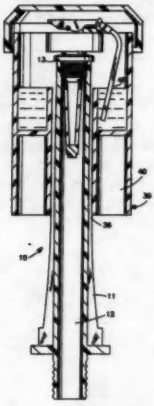
Filed Aug. 14, 1991, Ser. No. 745,600

Int. Cl.[5] F16K *31/18, 33/00*

U.S. Cl. 137—414 2 Claims

1. In a differential pressure type valve of the type having a vertically oriented water supply riser, a main valve mounted to said riser to control the flow of water from said riser, a pilot valve on said main valve to control the opening and closing of said main valve, a pivot member pivotally mounted to said main valve to control the opening and closing of said pilot valve, a float freely fitted over said valves and riser adapted to rise and fall with the level of water in a tank in which the riser is fitted, said float having an upwardly-facing abutment means,

said float being so disposed and arranged as to rest on said pivot member when the water level in the tank is below an intended storage level, and to rise free of the pivot member when the water level is at or above the intended storage level, the improvement comprising:



a boost link on said pivot member projecting downwardly toward said abutment means and so disposed and arranged as to be boosted by said abutment means when the water level is at or above the desired storage level to assure that the pilot valve is set in a condition to close the main valve.

5,150,733

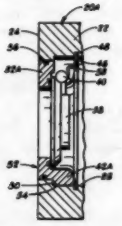
COMPACT SWING CHECK VALVE

John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Continuation of Ser. No. 430,169, Nov. 1, 1989, abandoned, Continuation-in-part of Ser. No. 286,979, Dec. 20, 1988, Pat. No. 4,982,759. This application Oct. 25, 1991, Ser. No. 783,722

Int. Cl.[5] F16K *15/03*

U.S. Cl. 137—454.2 **1 Claim**



1. A swing check valve, comprising:

a body having upstream and downstream ends and a bore therethrough interconnecting the upstream and downstream ends;

a ring-shaped unitary structure in the bore insertable through the downstream end of the bore having an upstream end and a downstream end and an annular shoulder formed on the outer periphery thereof intermediate the upstream and downstream ends thereof and facing upstream, said structure having a valve seat portion providing a seating face facing downstream, and a ring-shaped cage portion extending downstream from the seating face;

a disc pivotally supported by the cage portion and sized to mate with the seating face to prevent flow upstream through the valve;

said bore having an annular shoulder formed therein facing downstream to mate with the annular shoulder on the ring-shaped structure preventing upstream movement of the ring-shaped structure, the shoulder of said bore being positioned to locate the downstream end of the ring-shaped structure in spaced relation from the downstream end of the body; and

a retainer ring mounted in a mating groove in the bore engaging the downstream end of the ring-shaped structure to hold the ring-shaped structure against downstream movement in the body.

5,150,734

PROCESSING APPARATUS AT REDUCED PRESSURE AND VALVE USED THEREFOR

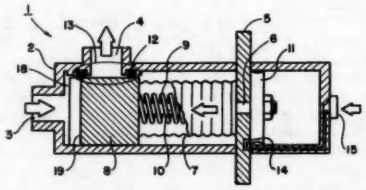
Takahiro Chiba, Iwate, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 13, 1990, Ser. No. 508,556

Claims priority, application Japan, Apr. 13, 1989, 1-93573

Int. Cl.[5] F16K *3/32, 31/122*

U.S. Cl. 137—567 **23 Claims**



1. An apparatus for processing semiconductor wafers at reduced pressure comprising a vacuum chamber and a pumping system connected with the chamber, said pumping system including at least a roughing pump, an exhaust pipe connecting the chamber with the roughing pump and a valve inserted in said exhaust pipe for opening and closing gas flow therethrough, said valve comprising:

a valve casing having valve inlet and outlet openings connected with said exhaust pipe;

a valve seat comprising a gasket surrounding at least one of said openings and having a first surface extending in a direction generally perpendicular to an axis of said opening; and

a valve plug having a second surface, the second surface being parallel with the first surface and contacting airtightly with said gasket at a valve closed position, the valve plug being movable substantially in the direction along the first surface for closing and opening said valve, thereby causing said opening for gas flow to be opened or closed gradually by the slide movement of the second surface of the valve plug on said valve seat along the first surface.

5,150,735

CONTAINMENT VALVE THAT ALLOWS CONTAMINATION FREE TRANSFER

Michael J. Bandy, Greenwood; Roy H. Byerly, and Robert T. Spoonmore, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 29, 1992, Ser. No. 827,357

Int. Cl.[5] F16L *37/28*

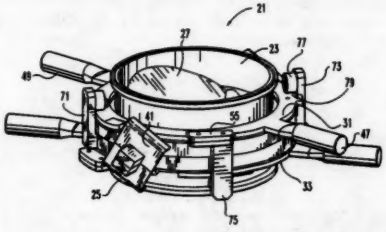
U.S. Cl. 137—614.06 **23 Claims**

1. A valve system, comprising:

a first container port and a second container port which are uncoupleable and coupleable with respect to each other between an uncoupled mode and a coupled mode respectively;

a first butterfly valve body pivotable about an axis which is oriented transverse to the first port and the second port, wherein said first butterfly valve body in a closed position seals the first port against flow of material therethrough;

a second butterfly valve body pivotable about said transverse axis, wherein said second butterfly valve body in a closed position seals the second port against flow of material therethrough, wherein in said coupled mode said first and second butterfly valve bodies are immediately adjacent each other and are simultaneously pivotable about



said transverse axis to an open position to allow flow of material through the first and second ports;

a first locking member which is rotatable circumferentially with respect to the first port from a first circumferential position to a second circumferential position, wherein in said first circumferential position said first locking member locks said first butterfly valve body in said closed position, and wherein in said second circumferential position said first locking member unlocks said first butterfly valve body to allow pivoting of said first butterfly valve body to said open position.

5,150,736

VALVE WITH CRENELLATED SEAT

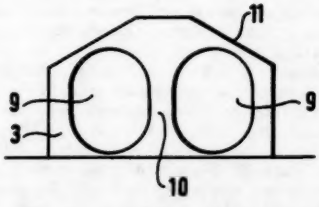
Michel Vincent de Paul, Senlis, and Francois Detanne, Paris, both of France, assignors to GEC Alsthom SA, Paris, France

Filed Sep. 13, 1991, Ser. No. 759,281

Claims priority, application France, Sep. 13, 1990, 9011337

Int. Cl.[5] F16K *47/02*

U.S. Cl. 137—625.3 **4 Claims**



1. Valve comprising a cylindrical valve obturator engagable with an annular valve seat provided with circumferentially spaced crenellations disposed around the part of the valve seat on which the valve obturator rests, wherein each crenellation comprises on a radial surface thereof facing the cylindrical valve obrutartor, an axially extending central partition and two symmetrical openings with said radial surface extending respectively towards opposite lateral surfaces of the crenellation.

5,150,737

CERAMIC DISCS FOR TAPS AND TAPS EQUIPPED WITH SUCH DISCS

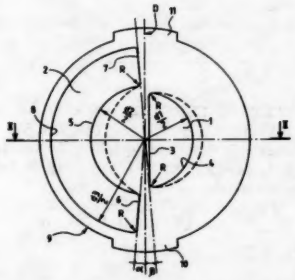
Daniel Clerc, Le Perreux, France, assignor to C.I.C.E. S.A., France

Filed May 24, 1990, Ser. No. 528,292

Claims priority, application France, Jun. 22, 1989, 89 08313

Int. Cl.[5] F16K *3/08, 3/32*

U.S. Cl. 137—625.3 **20 Claims**



1. A half-turn type liquid tap comprising two superimposed discs in contact capable of rotation relative to each other about a common central axis to adjust the flow rate of a liquid, each disc of said two superimposed discs comprising first and second apertures, said first and second apertures being situated on opposite sides of a radial diametral distance from said common central axis of each said two discs and on opposite sides of a diametrical axis of each said two discs, said first aperture being in the central part of each said two disc and said second aperture being in the peripheral part of each said two discs so that in a closed position of said tap said first and second apertures in one of said two superimposed discs are angularly displaced approximately 180 degrees from said first and second apertures, respectively, in the other of said two superimposed discs and in a fully open position of said tap said first and second apertures of said two superimposed discs are respectively superposed.

5,150,738

ROLL COVER FOR DAMPENING APPARATUS

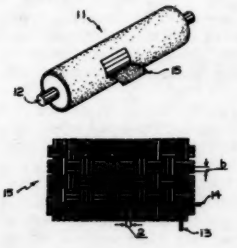
Hiroshi Nishiwaki, Izumi, Japan, assignor to Techno Roll Co. Ltd., Osaka, Japan and Jomac, Inc., Warrington, Pa.

Filed Apr. 3, 1991, Ser. No. 680,096

Claims priority, application Japan, Apr. 9, 1990, 2-94458; Jan. 1, 1991, 3-10004

Int. Cl.[5] D03D *3/02*

U.S. Cl. 139—420 R **12 Claims**



1. A cylindrically shaped woven cover used for a roller in dampening apparatus of an offset printing machine is characterized in that;

(1) said cover being comprised of a multiplicity of warps, said warps being composed of a hydrophilic fiber yarn, of

less than 220 denier, and arranged to run continuously in the direction of the axis of the roller with a setting density of more than 20 threads per centimeter in an unwetted state, and with one or several wefts of less than 220 denier, which are composed of a hydrophilic fiber yarn of which the hydroscopic shrinkage percentile is within 10 to 40%, said wefts having an inserting density of more than 20 threads per centimeter and of the same density as or less than said setting density of the warps before wetting;

(2) wherein the weight of a cloth of said cover is less than 200 g/m2; and

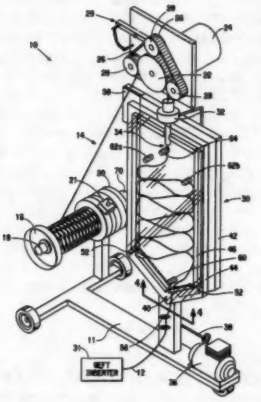
(3) the thickness of said cloth of said cover is less than 0.5 mm.

5,150,739

WEFT FEEDING THROUGH AN ACCUMULATOR WITHOUT SUBSTANTIAL TWIST

Daniel C. Blackwell, Bear, and Joseph E. Koskol, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 11, 1991, Ser. No. 728,457
Int. Cl.[5] D03D *47/34*
U.S. Cl. 139—452 **19 Claims**



1. Apparatus for the on-demand, low tension feeding of a filling member to weft insertion means of a loom without substantial twist, the demand for said filling member increasing rapidly as said loom accelerates from a stopped condition to process speed operation and decreasing rapidly as said loom decelerates from said process speed operation to said stopped condition, said filling member being taken up by said weft insertion means at a process speed take-up rate during said process speed operation, said apparatus comprising:

filling member supply means for supplying said filling member without substantial twist at an average rate equal to said process speed take-up rat by said weft insertion means;

a filling member accumulator having an inlet for receiving said filling member from said supply means and an outlet from which said filling member is withdrawn by said weft insertion means;

said filling member accumulator having two generally evenly spaced-apart walls with the distance between said walls being such that said filling member forms serpentine folds within said filling member accumulator which advance into said accumulator as said filling member is received through said inlet; and

control means for controlling said filling member supply means in response to said filling member being taken up by said weft insertion means and causing a sufficient amount of filling member to accumulate in said accumulator to meet the rapidly increasing demand for said filling member when said loom accelerates from said stopped condition to said process speed operation, said control means comprising:

first sensor means for detecting when said filling member is being withdrawn from said accumulator, said first sensor means being a throughbeam photocell positioned proximate said outlet;

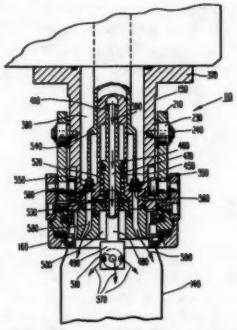
means responsive to said first sensor for activating said supply means when said filling member is detected being withdrawn from said accumulator and deactivating said supply means after a predetermined time period when said first sensor means does not detect said filling member being withdrawn.

5,150,740

FILLING VALVE

Chung J. Yun, Baltimore, Md., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Division of Ser. No. 420,575, Oct. 12, 1989, abandoned. This application Oct. 11, 1990, Ser. No. 595,966
Int. Cl.[5] B67C *3/02*
U.S. Cl. 141—6 **4 Claims**



1. A method of dispensing carbonated liquids from a counterpressure filling machine to a container comprising the steps of:

moving the container in proximity to a counterpressure valve in the counterpressure filling machine;

operating a gas valve to permit counterpressure gas to flow into a cylinder associated with a piston connected to a vent tube, thereby

increasing the pressure in the cylinder and displacing the piston to permit counterpressure gas to flow into the vent tube and thereby moving the vent tube into the container from the counterpressure valve;

filling the container with counterpressure gas through the vent tube until a pressure equilibrium is reached, whereby a liquid valve is opened by the action of a spring to permit carbonated liquid to flow into the container;

filling the container with the carbonated liquid, thereby displacing a substantial portion of the counterpressure gas from the container through the vent tube;

closing the liquid valve and sealing the vent tube;

venting remaining counterpressure gas from the container;

moving the vent tube from the container; and

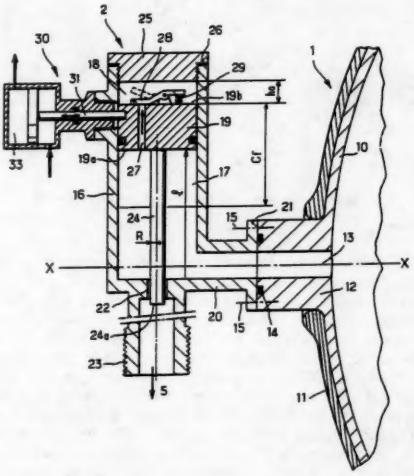
relieving pressure impedance in the cylinder developed by the migration of the piston in the vent tube.

5,150,741

DEVICE FOR CONTROLLING THE GAS STREAM DELIVERED BY A PRESSURIZED GAS RESERVOIR AND A GAS SUPPLY SYSTEM COMPRISING SUCH A DEVICE

Yves H. G. Valy, Medard en Jalles; Pascal D. Coquet, Bordeaux, and Michel Amagat, St Aubin du Medoc, all of France, assignors to Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Dec. 20, 1990, Ser. No. 631,331
Claims priority, application France, Dec. 27, 1989, 89 17265
Int. Cl.[5] B67D *1/12*; B65B *31/04*
U.S. Cl. 141—18 9 Claims



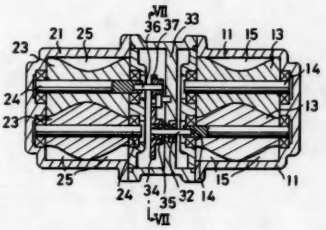
4. Pressurized gas supply system comprising in combination:
a reservoir containing a pressurized gas;
said reservoir having a first opening through which gas can flow out of said reservoir;
a device for controlling the rate of flow of gas from said first opening, said device comprising:
a cylinder having one closed end;
a movable piston within said cylinder dividing said cylinder into a first chamber and a second closed chamber;
said first chamber being adapted to receive a flow of gas from said first opening and being provided with an orifice through which a controlled stream of gas can flow out of said first chamber;
a conduit for gas flow from said first opening to said first chamber;
an elongated core connected to said piston and located within said first chamber,
said core passing through and cooperating with said orifice to define a second opening having a variable flow section as a function of the position of said piston in said cylinder;
a passage establishing gaseous communication between said first and second chambers of said cylinder;
a non-return valve associated with said passage permitting flow of gas from said first chamber to said second chamber but preventing flow of gas from said second chamber to said first chamber;
controllable locking means for locking said piston in position in said cylinder;
and a stop valve in fluid communication with said orifice for stopping the flow of gas delivered by said reservoir.

5,150,742

VAPOR RECOVERING DEVICE FOR VOLATILE LIQUID DISPENSING APPARATUS

Toshiaki Motohashi, Kanagawa; Yoichi Harada, and Tsuyoshi Yanagihara, both of Kamakura, all of Japan, assignors to Tokyo Tatsuno Co., Ltd., Tokyo, Japan

Filed May 30, 1991, Ser. No. 707,908
Claims priority, application Japan, Jun. 8, 1990, 2-150495
Int. Cl.[5] B65B *31/00*; F04B *17/00*
U.S. Cl. 141—59 6 Claims



1. A vapor recovery system comprising:
a duct for liquid,
a gun nozzle mounted at a free end of said duct,
a motor driven pump supplying liquid to said duct,
a vapor duct having a free end positioned for collecting vapor at a free end of said gun nozzle,
a hydraulic motor located in said liquid duct between said gun nozzle and said motor driven pump,
said hydraulic motor having a sealed casing containing a pair of rotors meshing with each other and adapted to be revolved by said liquid flowing through said hydraulic motor,
a pneumatic pump having a sealed casing containing a pair of meshing rotors is located in said vapor duct,
said rotors of said hydraulic motor having the same size and configuration as said rotors of said pneumatic pump, said hydraulic motor driving said pneumatic pump through multiplying gearing, and
said casing of said hydraulic motor and said casing of said pneumatic pump having a connection therebetween, said connection including a small diameter aperture formed at a location upstream of said pump rotors so that liquid forcedly supplied through said hydraulic motor may leak little by little into the pneumatic pump.

5,150,743

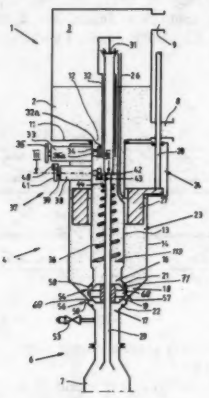
APPARATUS FOR ADMITTING METERED QUANTITIES OF LIQUID INTO BOTTLES OR OTHER CONTAINERS

Jacek Walusiak, Hamburg, Fed. Rep. of Germany, assignor to Alfill Getränketechnik GmbH, Hamburg, Fed. Rep. of Germany

Filed Mar. 26, 1991, Ser. No. 675,428
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1990, 4010413
Int. Cl.[5] B65B *43/42*; B67C *3/00*
U.S. Cl. 141—147 19 Claims

1. Apparatus for filling successive containers of a series of containers with metered quantities of a liquid, such as a carbonated beverage, comprising a vessel arranged to store a supply of liquid and having outlet means including at least one first outlet; liquid metering means including at least one liquid metering chamber having an inlet arranged to receive liquid from said at least one first outlet and a second outlet for admission of metered quantities of liquid into successive containers; and container filling means including at least one filling unit having a valve with a component movable between a first position in which said at least one first outlet is sealed to prevent the flow of liquid from said vessel into said at least one chamber and said second outlet is open to permit a metered

quantity of liquid to flow from said at least one chamber into a container, and a second position in which said second outlet is sealed and said at least one first outlet is open to permit the liquid to flow from said vessel into said at least one chamber,



and means for moving said component between said positions, said moving means comprising means for biasing said component to one of said positions and means for shifting said component to the other of said positions against the opposition of said biasing means.

5,150,744

MOORING APPARATUS

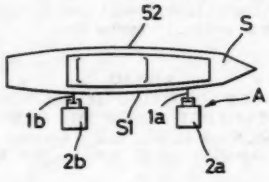
Nobuharu Hayashi, Kobe, and Hiroji Tanaka, Funabashi, both of Japan, assignors to Sumitomo Rubber Industries, Ltd. and Penta-Ocean Construction Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1991, Ser. No. 679,395

Claims priority, application Japan, Apr. 3, 1990, 2-35454

Int. Cl.[5] B63B *21/00*

U.S. Cl. 114—230 **6 Claims**



1. A ship mooring apparatus, comprising:

first and second sliding members secured to a side of a ship, said sliding members being vertically disposed and having a predetermined space therebetween;

first and second dolphins securely disposed adjacent to said ship, and corresponding to said sliding members;

first and second engagement means horizontally movably disposed in said first and second dolphins, respectively, said engagement means for slidably engaging said sliding members in a vertical direction;

first buffer means disposed on said first dolphin, for elastically contacting said first engagement member, thereby absorbing a forward rocking of said ship;

said second buffer means secured to said second dolphin, for elastically contacting said second engagement member, thereby absorbing a backward rocking of said ship; and

third buffer means disposed on said first and second dolphins for elastically contacting said first and second engagement members, respectively, wherein said third buffer means prevents said first and second engagement members from moving beyond a predetermined distance in right and left lateral directions.

5,150,745

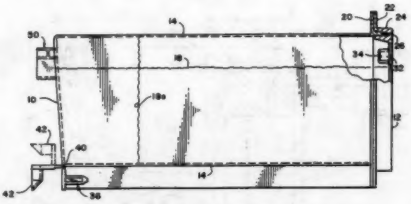
CONTAINER AND METHOD FOR FILLING BATTERIES WITH ELECTROLYTE

Dan Ford, Rte. 1, Box 480–A, and Benjamin J. Ford, Rte. 1, Box 484, both of Cosby, Tenn. 37722

Continuation-in-part of Ser. No. 456,846, Dec. 4, 1989, abandoned. This application Aug. 23, 1990, Ser. No. 571,496

Int. Cl.[5] H01M *2/36*

U.S. Cl. 141—241 **16 Claims**



1. For use with an acid cell battery having a plurality of cells to be charged with acid and inlets communicating with the cells respectively; a portable container having wall portion defining a chamber and acid in the chamber, one of said wall portions having a plurality of pouring spouts communicating with said chamber and alignable with the inlets of an associated battery such that said spouts may be simultaneously aligned with said inlets respectively to simultaneously pour acid from the chamber into the batter cells through the inlets when the container is placed into a pouring position relative to the battery, partition means in said chamber defining a plurality of cells, said spouts being in communication with said container cells respectively, and wherein said cells in the container are in communication with each other, and said wall portions include upper and lower opposite wall portions and opposite side wall portions, said partition means extend to and between said opposite side wall portions and from said upper wall portion towards said lower wall portion, and wherein said spouts are located in said upper wall portion and each spout includes a pouring passage, said container being charged with electrolyte at a level which is below all of the pouring passages when the container is positioned on a particular one of said side wall portions thereof.

5,150,746

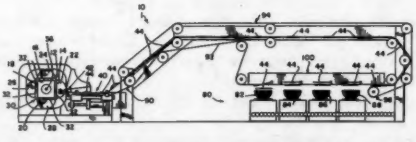
FLITCH TABLE

George Weil, Mississauga, Canada, assignor to David R. Webb Co., Inc., Edinburgh, Ind.

Continuation-in-part of Ser. No. 702,774, May 17, 1991, Pat. No. 5,101,874. This application Nov. 27, 1991, Ser. No. 800,642

Int. Cl.[5] B27L *5/02*

U.S. Cl. 144—209 B **17 Claims**



1. A flitch table for mounting a flitch for slicing of veneer

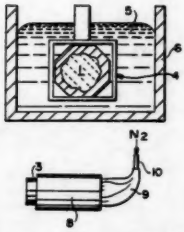
from the flitch by a knife, the flitch including a mounting side which lies adjacent the table when the flitch is mounted to the table, the mounting side including an opening, the table including a dog for projecting into the opening when the flitch is mounted to the table to fix the flitch to the table for slicing of the flitch, the dog having a flitch fixing position in which the flitch is fixed to the table by the dog and a flitch releasing position in which the flitch is not fixed to the table by the dog, and means for driving the dog between the fixing and releasing positions.

5,150,747

METHOD OF FORMING METAL MATRIX COMPOSITES BY USE OF AN IMMERSION CASTING TECHNIQUE AND PRODUCT PRODUCED THEREBY

John T. Burke, Hockessin, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 269,371, Nov. 10, 1988, Pat. No. 5,000,249. This application Mar. 18, 1991, Ser. No. 671,049
The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.
Int. Cl.[5] B22D *19/14*
U.S. Cl. 164—97 **20 Claims**



1. A method for forming a metal matrix composite body comprising:
forming a molten source of aluminum matrix metal;
forming at least one preform comprising a mass of substantially nonreactive filler material;
providing magnesium to at least one of the matrix metal and the preform;
providing a nitrogenous atmosphere to be in communication with at least one of the preform and the matrix metal for at least a portion of the spontaneous infiltration;
reacting said nitrogenous atmosphere with said magnesium so as to form a magnesium nitride coating on at least a portion of the filler material comprising said preform;
immersing said preform into said molten source of aluminum matrix metal; and
spontaneously infiltrating at least a portion of the preform with molten aluminum matrix metal.

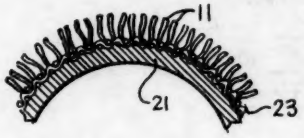
5,150,748

ADVANCED SURVIVABLE RADIATOR

James B. Blackmon, Irvine; Robert E. Drubka, Huntington Beach; John S. Kirby, Long Beach; Dave Johnson, Riverside; R. Andrew Gerrick, Santa Ana; Thomas Ingersoll, Laguna Niguel; Nelson Jones, Huntington Beach; Brian Seaworth, Huntington Beach, and Gary Glover, Huntington Beach, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 18, 1990, Ser. No. 539,135
Int. Cl.[5] B64G *1/50*; F28F *13/18*
U.S. Cl. 165—41 **5 Claims**

1. A spacecraft heat rejection system comprising:
a space vehicle having an excess of thermal energy;
a metallic surface attached to said space vehicle;
a braze material bonded to said metallic surface; and,
a multiplicity of elongate fibers each having a first end secured within said braze material and a second end extending away from said braze material, and wherein said multiplicity of elongate fibers are made from a material selected from the group consisting of:
fiberglass;
glass;
quartz;
saphire;



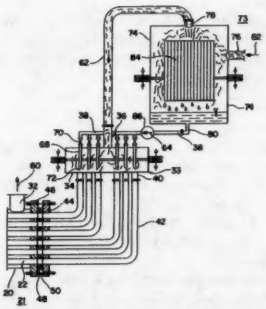
tantalum;
diamond;
carbon carbon;
stainless steel;
aluminum;
beryllium; and,
copper.

5,150,749

HEAT EXCHANGER APPARATUS, PARTICULARLY FOR HYBRID HEAT PUMPS OPERATED WITH NON-AZEOTROPIC WORK FLUIDS

György Bergmann; Geza Hivessy; Tamás Homola; Árpád Bakay, and Mihály Horváth, all of Budapest, Hungary, assignors to Energiagazdalkodasi Intezet, Budapest, Hungary

Filed Feb. 27, 1991, Ser. No. 661,311
Claims priority, application Hungary, Feb. 27, 1990, 1058/90
Int. Cl.[5] F28F *25/02*; F25B *39/00*
U.S. Cl. 165—115 **21 Claims**



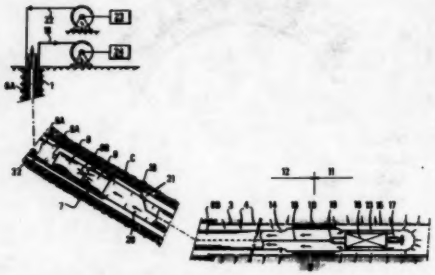
1. Heat exchanger apparatus comprising a substantially horizontal countercurrent heat exchanger of the shell-and-tube type having heat exchanger tubes and operating with non-azeotropic work fluids, characterized in that a fluid distributor with fluid outlets, the number of which corresponds to the number of the heat exchanger tubes of the heat exchanger, is provided upstream of the heat exchanger and the heat exchanger tubes are connected each to one fluid outlet of the fluid distributor.

5,150,750

DEVICE FOR ACTIVATING AND MEASURING NONFLOWING PRODUCING WELLS

Jacques Lessi, Maule, and Christian Wittrisch, Rueil-Malmaison, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 28, 1991, Ser. No. 723,392
Claims priority, application France, Jun. 29, 1990, 90 08270
Int. Cl.[5] E21B *4/04*
U.S. Cl. 166—66.4 6 Claims



1. A device for activating a non-flowing well traversing a subterranean zone containing effluents and for measuring effluents produced by an activation of the device, the well including a liner perforated at least in a portion thereof extending through said subterranean zone, the device comprising:

a flow string connected with a surface installation, said flow string having a diameter less than a diameter of the liner so as to define an annular space between the liner and the flow string;

means for closing the annular space to divide the liner into an upstream part and a downstream part on respective sides of the means for closing, said upstream part and said downstream part being isolated from each other by said means for closing;

means for measuring at least a portion of the produced effluents;

means for activating the production of the well including pumping means inserted in the flow string at a depth accessible to the effluents;

a side entry sub inserted in a portion of the string at a position between the pumping means and said means for measuring; and

a multiconductor cable associated with connecting means entering the flow string at the level of said side-entry sub for connecting the means for measuring to the surface installation.

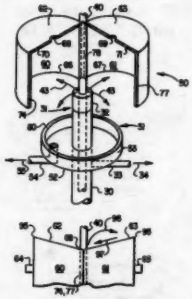
5,150,751

STUFFING BOX LEAK CONTAINMENT APPARATUS

Anthony R. Burton; Monte K. Mitchell, and Raymond Hernandez, all of Andrews, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 29, 1991, Ser. No. 736,840
Int. Cl.[5] E21B *33/08*
U.S. Cl. 166—81 6 Claims

1. In a production wellhead for a well having a stuffing box through which a polished rod reciprocate when said well is producing fluid, the improvement comprising a liquid collection means carried by said wellhead below said stuffing box, said collection means encircling said wellhead and having a closed bottom member and an upstanding side means which encircles said wellhead and is fixed to said bottom member in a liquid tight manner, said bottom member having drain means operably connected thereto for draining liquid that collects on said bottom member within said side means, at least two separate upstanding hollow shapes each having an open bottom and a closed top means terminating in an apertured edge means, said closed top means of said hollow shapes slant downwardly toward their respective terminating apertured edge means and said polished rod so that any liquid that may collect on top of said top means will gravitate toward said polished rod and pass around said polished rod into the interior of said hollow shapes, each such shape terminating in a pair of opposing upstanding edge means, said shapes being unconnected to and separable from said liquid collection means, said shapes being of such cross-sectional configuration that when their upstanding edge means and apertured top edge means are brought into abutment with one another the volume enclosed within said abutting shapes encircles said wellhead and extends from said bottom member of said collection means to above said stuffing box and said apertured top edge means form an opening that encircles said polished rod, hinge means joining said shapes along one pair of abutting upstanding edge means so said shapes can be pivoted toward and away from one another, whereby said abutting shapes when resting upon said



bottom member enclose said stuffing box so that any liquid leakage from said stuffing box even when under pressure is kept contained within said abutting shapes and collected in said liquid collection means while at the same time allowing normal reciprocation of said polished rod in said stuffing box and holding means carried by at least one of said wellhead and said liquid collection means for slidably fixing said hollow shapes in place while allowing sufficient upward movement of said shapes so each entire shape can be raised above said upstanding side means and then moved apart from their abutting relationship along one pair of upstanding edge means to provide access to the stuffing box said shapes enclose when in their normal closed abutting relationship, said holding means being composed of a closed loop member having a plurality of eyes slidably engaging said loop member, each eye carrying a support arm, part of said support arms being connected to one of said hollow shapes and the remainder of said support arms being apportioned between the remainder of said hollow shapes.

5,150,752

OIL WELL-FIRE CONTAINMENT DEVICE

Ole Gunst, 19475 Grand View Dr., Topanga, Calif. 90290, and Gary R. Fisher, 2251 Federal Ave., Los Angeles, Calif. 90064

Filed Apr. 22, 1991, Ser. No. 690,168
Int. Cl.[5] E21B *35/00*
U.S. Cl. 166—88 18 Claims

1. An apparatus for reaming, tapping and sealing an oil well casing against escaping oil comprising:

a sleeve with insertion means for introducing the sleeve into a well casing;

reaming means for preparing the casing for tapping;

alignment guide means for aligning said sleeve with said casing;

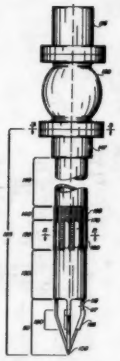
tapping means for tapping the casing;

threading means for threading said sleeve into said casing;

sleeve extension means for controlling the depth of the sleeve seal in said casing;

a valve-to-sleeve adaptor coupled to the sleeve;

a valve, detachably coupled to the valve-to-sleeve adaptor, for closing the casing opening after the sleeve is attached to the casing;



a valve-to-turntable adaptor, coupled to the valve; and

a turntable, detachably coupled to the valve-to-turntable adaptor, for driving the sleeve into threaded engagement with the well casing.

5,150,753

GRAVEL PACK SCREEN HAVING RETENTION MESH SUPPORT AND FLUID PERMEABLE PARTICULATE SOLIDS

John E. Gaidry, Lafayette; Larry J. Quebedeaux, Sunset, both of La.; Joseph F. Donovan, Spring, and Jefferson P. Ashton, Conroe, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 521,448, May 10, 1990, which is a continuation of Ser. No. 504,535, Apr. 4, 1990, abandoned, which is a continuation of Ser. No. 400,864, Aug. 30, 1989, abandoned, which is a continuation of Ser. No. 253,967, Oct. 5, 1988, Pat. No. 4,917,183. This application Nov. 26, 1991, Ser. No. 799,841

The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.

Int. Cl.[5] E21B *43/08*

U.S. Cl. 166—278 **17 Claims**

1. An apparatus for use on a subterranean well conduit to prevent particulate matter in said well of a pre-determinable size from passing into said conduit with the well production fluids, comprising:

an inner member having an interior wall and an exterior wall, said exterior wall having a selected exterior wall shape;

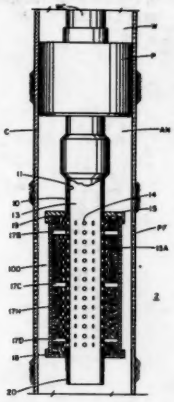
a fluid flow passageway defined within the interior wall of said inner member;

fluid flow passage means extending from the interior of said inner member through the exterior wall of said inner member and in communication with said fluid flow passageway;

a retention barrier disposed around and secured to the exterior wall of said inner member and passing across said fluid flow passage means, and having fluid flow openings therethrough, said retention barrier being at least in-part structurally dependent on said inner member and conforming in shape to said selected exterior wall shape of said inner member when secured thereto;

a fluid permeable bed of particulate solids around the exterior of said retention barrier sized to prevent effectively all such particulate matter in said well from passing inwardly with the production fluids through said fluid permeable bed and through said fluid flow passage means and into said fluid flow passageway when said conduit and said apparatus are positioned within said subterranean well;

whereby said retention barrier is sized to prevent the particulate solids of said fluid permeable bed from passing into said fluid flow passage means and further sized to permit any particulate matter in said well passing through said fluid permeable bed to pass through the retention mesh means and into said fluid flow passageway and through the subterranean well conduit;



a circumferentially shaped outer fluid permeable housing positioned around the exterior of said fluid permeable bed and having fluid passages therethrough for transmission of the production fluids within said well through and housing, said fluid passages in said outer housing being sized to prevent effectively all of said particulate solids of said fluid permeable bed from passing exteriorly through said housing and into said well; and

means for securing said apparatus to said subterranean well conduit.

5,150,754

AQUEOUS AND PETROLEUM GEL METHOD FOR PREVENTING WATER-INFLUX

Craig H. Phelps, Kern County, Calif., and E. Thomas Strom, Dallas, Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed May 28, 1991, Ser. No. 706,438

Int. Cl.[5] E21B *33/138*

U.S. Cl. 166—294 **5 Claims**

1. A method for preventing damage to a water-sensitive hydrocarbonaceous fluid-producing zone of a formation which is penetrated by a well which has a water-influx problem comprising:

a) injecting into the well at a water-sensitive hydrocarbonaceous fluid-producing zone a mixture capable of forming a solid hydrophobic gel in situ sufficient to temporarily close pores in said zone;

b) allowing the mixture from step a) to remain in the water-sensitive zone for a time sufficient to form a solid hydrophobic gel so as to preclude fluid entry into said zone;

c) injecting into the well at a water-influx zone an aqueous gel mixture capable of forming a substantially solid permanent hydrophilic gel in the water-influx zone so as to preclude fluid entry into said zone; and

d) allowing the mixture from step c) to form a solid hydrophilic gel sufficient to preclude fluid entry into the water-influx zone.

5,150,755

MILLING TOOL AND METHOD FOR MILLING MULTIPLE CASING STRINGS

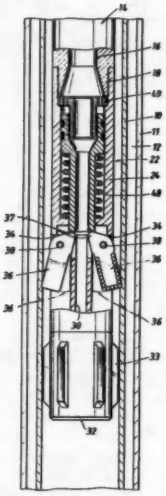
Terry E. Cassel, Bossier City; Harold E. Payne, Shreveport, and Gerald D. Lynde, Bossier City, all of La., assignors to Baker Hughes Incorporated

Continuation-in-part of Ser. No. 621,063, Dec. 3, 1990, which is a continuation of Ser. No. 181,812, Apr. 15, 1988, Pat. No. 4,978,260, which is a continuation-in-part of Ser. No. 816,287, Jan. 6, 1986, Pat. No. 4,796,709. This application Apr. 4, 1991, Ser. No. 680,702

The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.

Int. Cl.[5] E21B *10/26*

U.S. Cl. 166—297 21 Claims



1. A method of cutting through the walls of a pair of generally concentric inner and outer casings and then simultaneously removing a predetermined length of said inner and outer casings; said method comprising the following steps:

providing a cutting tool having pivotally mounted blades adapted for swinging outwardly in a generally radial direction from a tool body received within a casing;

providing a plurality of hard cutting elements of a predetermined shape and size on selected areas along the outer periphery of said blades including the upper and lower sides and the outer ends of said blades when pivoted radially outwardly;

positioning said cutting tool within said inner casing;

rotating said tool at a predetermined rotational speed with said blades expanded radially outwardly into cutting engagement with the inner periphery of said inner casing;

first cutting through the wall of said inner casing with the outer ends of said blades engaging the inner periphery of said inner casing in cutting relation;

then cutting through the wall of said outer casing with the cutting elements on the outer ends of said blades engaging the inner periphery of said outer casing in cutting relation; and

next engaging simultaneously the upper annular cut ends of both said inner and outer concentric casings in a cutting action by the cutting elements on the lower sides of said blades resulting from downward movement of said tool for removing a predetermined length of said casings.

5,150,756

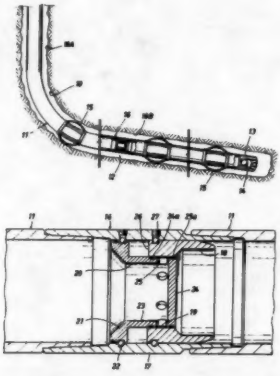
WELL COMPLETION APPARATUS

Hedayat H. Hassanzadeh, Houston, Tex., assignor to Davis-Lynch, Inc., Pearland, Tex.

Filed Feb. 25, 1991, Ser. No. 660,708

Int. Cl.[5] E21B *34/10*

U.S. Cl. 166—318 4 Claims



2. For use in completing a well having a well bore whose lower end extends substantially horizontally, a tool comprising

a tubular member connectible in a casing string to be lowered into the lower end of the well bore and having a back pressure valve installed near its lower end,

a plug having a passageway therethrough,

means connecting the plug to the tubular member,

a valve member, means mounting said valve member for vertical movement between one position closing the passageway and another position supported from the plug and opening the passageway,

means holding the valve member in its closed position, and

means sealing between the tubular member, plug and valve member when the valve member is in its closed position to separate a high density fluid thereabove from a low density fluid therebelow as the casing string is lowered into the well bore,

said holding means being releasable in response to a predetermined increase in pressure of the high density fluid to permit the valve member to be moved to its open position,

said valve means having a seat and said connecting means being releasable upon lowering of wiper plug means onto the seat to close the passageway and in response to a further predetermined increase in pressure of the high density fluid above the wiper plug means, whereby said plug and valve member may be lowered through the tubular member.

5,150,757

METHODS AND APPARATUS FOR DRILLING SUBTERRANEAN WELLS

Dwight S. Nunley, 500 Oakwood Dr., Gretna, La. 70056

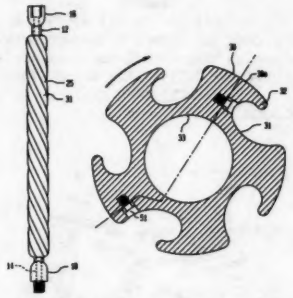
Continuation-in-part of Ser. No. 595,550, Oct. 11, 1990, Pat. No. 5,040,620. This application May 3, 1991, Ser. No. 695,520

Int. Cl.[5] E21B *17/22*

U.S. Cl. 175—323 6 Claims

1. A component for attachment to a drillpipe which is part of a drillstring carrying a drillbit or core barrel, said drillstring rotatably driven in a working direction, which drillpipe contains a standard box tool joint at one end and a standard pin tool joint at the other end, which tool joints are of a diameter greater than the section of drillpipe between the two joints, and which drillpipe component is comprised of two elongated

cylindrical half sections for clamping over at least a portion of the narrower section of drillpipe and which components, on its outer surface, contains at least one helical pumping chamber having a twist, when viewed in axial elevation, opposite to that



in which said drillstring is rotatably driven in said working direction, said pumping chamber, when viewed in traverse section, having an undercut portion relative to the surface of the cylindrical half-section, said undercut portion defining a lip.

5,150,758

ROTARY RECEPTACLE SCALE

Bruno Gmuer, St. Gallen, Switzerland, assignor to Buehler AG, Uzwil, Switzerland

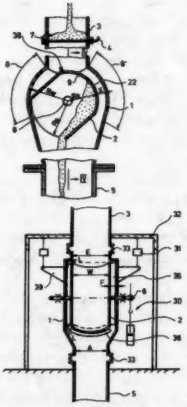
PCT No. PCT/CH90/00042, § 371 Date Oct. 24, 1990, § 102(e) Date Oct. 24, 1990, PCT Pub. No. WO90/11496, PCT Pub. Date Oct. 4, 1990

PCT Filed Feb. 26, 1990, Ser. No. 598,691

Claims priority, application Switzerland, Mar. 17, 1989, 01000/89

Int. Cl.[5] G01G *13/22, 23/14;* G01F *11/10*

U.S. Cl. 177—84 **10 Claims**



1. Rotary receptacle scale comprising: a casing:

a cup-shaped weighing receptacle and mechanical positive guidance means for moving the weighing receptacle in the casing from a filling position into an emptying position, said weighing receptacle and said casing being constructed as a rotary lock analogous to the lock rotor and lock wheel housing, wherein the weighing receptacle has a horizontal axis of rotation;

said weighing receptacle having a base and an opening area both with a rotationally cylindrical shape with reference to the center of rotation of an axle.

5,150,759

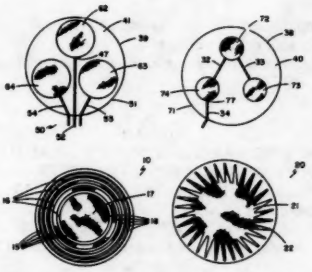
CAPACITOR-SENSOR

John S. Borchard, 97-A Lowell Ave., Newton, Mass. 02160

Filed Oct. 29, 1990, Ser. No. 604,174

Int. Cl.[5] G01G *3/14;* H01G *7/00;* G01L *9/12, 1/26*

U.S. Cl. 177—210 C **30 Claims**



1. An improved capacitor-sensor formed between two rigid, closely-spaced and facing, first and second plates, each with a perimeter, facing and nonfacing surface and with specific electrode patterns on each facing surface thereby forming a plurality of capacitors sensitive to displacement between the plates, comprising:

a plurality of separate conductive regions on the facing surface of the second plate;

a plurality of separate conductive regions on the facing surface of the first plate, corresponding to and facing the second plate conductive regions; and

wherein one of each corresponding regions is a subset of the other.

5,150,760

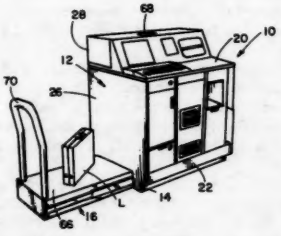
AUTOMATED CURBSIDE CHECK-IN COUNTER

James A. Johnson, 2012 Goldenrod La., Arlington, Tex. 76013

Filed Dec. 9, 1991, Ser. No. 803,985

Int. Cl.[5] G01G *19/00*

U.S. Cl. 177—245 **28 Claims**



1. A portable check-in counter comprising:

A) a cabinet unit having a top, a bottom first and second ends, a front and a rear, and further including

(1) a wheel unit mounted on said cabinet unit bottom,

(2) a plurality of access doors mounted on said cabinet unit,

(3) a turret unit mounted on said cabinet unit top, said turret unit including a window for displaying a computer screen, a window for displaying flight information, and a storage compartment door on said turret unit,

(4) a first scale readout on said cabinet unit;

B) a scale unit including

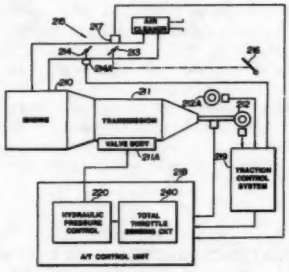
(1) a bed having a weighing mechanism therein,
(2) mounting means slidably mounting said bed on said cabinet unit for sliding movement between a use position extending from said cabinet unit and a storage position within said cabinet,
(3) lead means connecting said weighing mechanism to a computer located inside said cabinet unit;
C) a printer compartment in said cabinet unit and including
(1) a paper storage means, and
(2) a compartment for storing a printer;
D) a compartment for storing the computer in said cabinet unit;
E) a compartment for storing heating and air conditionng means in said cabinet unit; and
F) a compartment for storing an overall control panel in said cabinet unit.

5,150,761

LINE PRESSURE ARRANGEMENT FOR AUTOMOTIVE POWER TRAIN INCLUDING TRACTION COMPANY

Shigeki Shimanaka, Hadano, and Yuji Kato, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Aug. 14, 1990, Ser. No. 566,690
Claims priority, application Japan, Aug. 23, 1989, 1-216260
Int. Cl.[5] B60K *13/02*
U.S. Cl. 180—197 **2 Claims**



1. An automotive power train, comprising:
an internal combustion engine, said internal combustion engine having an induction passage in which first and second serially arranged throttle valves are disposed, the first throttle valve being responsive to the amount of displacement of a manually operable member, the second throttle valve being operatively connected to a servo device;
traction control means for controlling the operation of said servo device in accordance with selected operational parameters which are indicative of traction loss and the presence of wheel slip to adjust the amount of torque being generated by the engine, to thereby improve vehicle traction;
a transmission operatively connected with said internal combustion engine, said transmission including a source of selectively variable line pressure, the variable line pressure source being arranged to be responsive to an input indicative of the engine torque whereby selective application of the line pressure allows selection from four forward and one reverse gear ratios;
a transmission control unit, operatively connected with said traction control means and a sensor which detects the opening degree of the first throttle valve; and
total throttle sensing means for determining which of said first and second throttle valves is closed the most and for supplying an input indicative of engine torque to said line pressure source in accordance with the opening degree of the throttle valve which is closed the most, said total throttle opening sensing means being included in said transmission control unit.

5,150,762

PERSONAL MOBILITY VEHICLE

Aaron H. Stegeman, and Ronald F. Bechler, both of George, Iowa, assignors to Ranger All Season Corp., George, Iowa

Filed Apr. 26, 1991, Ser. No. 691,703
Int. Cl.[5] B60K *1/00*
U.S. Cl. 180—208 **15 Claims**

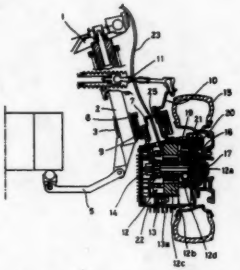
1. A personal mobility vehicle comprising, in combination:
(a) a first unit including a first frame, a wheel spindle pivotally mounted to said first frame, and a steering mechanism mounted to said spindle;
(b) a second unit including a second frame and axle means rotatably mounted to said second frame;
(c) motive means operatively connected to said axle means; and
(d) connection means for connecting said first and second frames, said connection means including
(i) a first substantially vertical plate having a depending lip,
(ii) a second substantially vertical plate having a depending J-shaped hook portion, the hook portion having a receiver portion facing said first plate and so disposed and arranged as to receive and engage the depending lip, one of said first and second plates being mounted to said first frame and the other of said first and second plates being mounted to said second frame,
(iii) a latch receiver mounted to one of said first and second frames,
(iv) a latch mounted to the other of said first and second frames, said latch including a reactive surface, said latch being arranged to engage said latch receiver when said first plate bears against said second plate,
(v) bias means biasing the latch to engage the latch receiver,
(vi) a latch operator connected to the latch for disengaging the latch from the latch receiver,
said second plate being so disposed and arranged relative to the first plate as to compressively bear against said first plate when the depending lip of the first plate is received and engaged by the J-shaped hook portion of the second plate and the latch engages the latch receiver to thereby assemble said first and second frames, said latch operator being operable to disengage the latch from the latch receiver to permit disassembly of the first and second frames, the reactive surface of the latch engaging the one frame to react against the bias means to permit the latch to engage the latch receiver without operation of the latch operator to permit assembly of the first and second frames.

5,150,763

WIRING AND PIPING ARRANGEMENT FOR A VEHICLE MOTOR

Mitugu Yamashita; Mutsumi Kawamoto, both of Tokyo, and Hidemitsu Inagaki, Nishio, all of Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Apr. 24, 1991, Ser. No. 690,158
Int. Cl.[5] B60K *17/30*
U.S. Cl. 180—252 5 Claims



1. A vehicle wheel motor apparatus providing for connection of a wheel motor to a power source, said apparatus comprising:

a wheel motor connected to a wheel;

a wheel support member connected to a vehicle frame through a damper;

an internal gear rotatably supported on the wheel support member;

a pivot fixed to a casing of said wheel motor and provided with a hollow interior portion and an external gear meshing with said internal gear; and

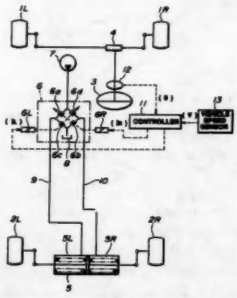
a power source lead connecting the power source to the wheel motor, said power source lead extending through said hollow interior portion of said pivot.

5,150,764

VEHICLE REAR WHEEL STEER ANGLE CONTROL SYSTEM

Takaaki Eguchi, Isehara, and Yuzo Sakita, Machida, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 284,414, Dec. 14, 1988, abandoned.
This application Oct. 1, 1990, Ser. No. 593,269
Claims priority, application Japan, Dec. 28, 1987, 62-330281
The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—141 14 Claims



11. A rear wheel steering control system for a vehicle, comprising:

a steering actuator for steering the rear wheel of a vehicle in response to a control signal representing a desired rear wheel steer angle;

a steering input sensor for sensing a steering input of said vehicle; and

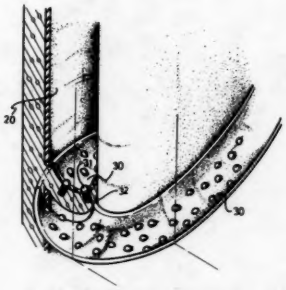
a controller which is connected with said steering input sensor, and which produces said control signal representing said desired rear wheel steering angle which is equal to the sum of a first term determined in accordance with said steering input, and a second term substantially proportional to a second derivative of said steering input with respect to time.

5,150,765

FIRE ESCAPE

Yen-Huang Chen, No. 5, Tapeng Rd., Taichung, Taiwan

Filed Aug. 8, 1991, Ser. No. 742,841
Int. Cl.[5] A62B *1/20*
U.S. Cl. 182—48 1 Claim



1. A fire escape comprising a housing formed in a building which includes a plurality of levels each having an opening formed therein and communicated with said housing; and means disposed in said housing for transferring people to any lower level and to the ground, said means including a helical pathway formed in said housing and communicated with each of said openings so that people can slide to any lower level and to the ground via said pathway, said pathway including a plurality of holes formed in said upper surface thereof, a protrusion disposed in each of said holes, each of said protrusions including a spring and a ball received in said holes of said pathway, said balls extending outward beyond said upper surface of said pathway such that said protrusions provide a frictional force to said people.

5,150,766

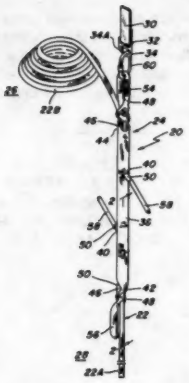
SLIDING ANCHOR SYSTEM AND METHOD OF USE

Michael Bell, 1705 Triumphe Way, Warrington, Pa. 18976

Filed Oct. 4, 1991, Ser. No. 771,666
Int. Cl.[5] A62B *1/20*
U.S. Cl. 182—100 22 Claims

1. An anchor system for securement to a fixed anchor point at an elevated position on a structure, said system comprising a rope arranged to be extended between said elevated position and a lower position, and slidable connection means, said slidable connection means being arranged to be releasably secured to said fixed anchor point and comprising a flexible tubular member woven of strands of fibers, said tubular member having a pair of ends, a first one of said ends including an extension projecting therefrom, said one extension comprising a connector arranged to be releasably secured to said fixed anchor, said rope extending through said tubular member, said tubular member when compressed longitudinally having a sufficiently large internal diameter that said rope means may slide therethrough, said tubular member being arranged to be extended longitudinally upon the application of a pulling force

to each of said ends, whereupon said internal diameter is reduced so that said rope is tightly frictionally engaged by said



tubular member to preclude said rope means from sliding through said tubular member.

5,150,767

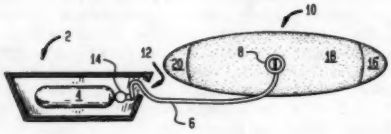
PORTABLE SELF-CONTAINED IMPACT SYSTEM

Ralph A. Miller, Monmouth Beach, N.J., assignor to Air Cruisers, Inc., Belmar, N.J.

Filed Feb. 19, 1991, Ser. No. 656,731

Int. Cl.[5] A62B *5/00*

U.S. Cl. 182—137 **13 Claims**



4. A portable self-contained impact system, comprising:

a closed reservoir for storing an inflating gas at a high pressure, and including a valve which is user-actuable for opening the reservoir;

an inflatable member including a plurality of adjacent chambers having a substantially central chamber;

a plurality of valve means interconnecting said plurality of adjacent chambers;

a hose and an ejector which entrains ambient air coupled to the reservoir and to the inflatable member, said hose and ejector effective for permitting gas flow from the reservoir to the inflatable member and through the plurality of valve means to inflate the plurality of adjacent chambers when the valve is user-actuated for opening the reservoir; and

the inflatable member being a closed member so as to avoid venting of the inflating gas when said member is impacted, with impacting energy being dissipated when gas flows through the plurality of valve means from impacted chambers at a high gas pressure to adjacent non-impacted chambers at a low gas pressure.

5,150,768

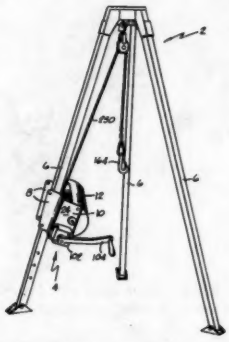
LOAD LIMITING APPARATUS FOR A HOIST

Wayne L. Olson, Central Point, Oreg., and Gary E. Choate, Lakewood, Colo., assignors to Rose Manufacturing Company, Englewood, Colo.

Continuation-in-part of Ser. No. 605,240, Oct. 29, 1990, Pat. No. 5,090,507. This application Oct. 3, 1991, Ser. No. 770,540

Int. Cl.[5] A62B *1/10*

U.S. Cl. 182—234 **20 Claims**



1. A fall arresting apparatus comprising:

a shaft mounted at a relatively fixed axial location to permit rotation thereof in a clockwise direction or a counter-clockwise direction;

drive means mounted on said shaft so that rotation of said drive means rotates said shaft in one of said clockwise or counter-clockwise directions;

holding means for preventing rotation of at least a portion of said drive means in the opposite of said one of said clockwise or counter-clockwise directions;

arresting means for applying a force to rotate said drive means and for permitting controlled rotation of said drive means in the opposite of said one of said clockwise or counter-clockwise directions but arresting uncontrolled rotation of said drive means in the opposite said one of said clockwise or counter-clockwise directions; and

control means mounted for axial movement on said shaft for automatically controlling the operation of said arresting means.

5,150,769

CONTROLLED-FLOW LUBRICATING SYSTEM

Kenneth E. Major; John L. Baker, and David K. Braunagel, all of Houston, Tex., assignors to Hy-Tech Hydraulics, Inc. and Michael P. Breston, both of Houston, Tex.

Continuation of Ser. No. 818,503, Jan. 13, 1986, abandoned. This application Nov. 27, 1987, Ser. No. 126,307

Int. Cl.[5] F16N *13/20*

U.S. Cl. 184—31 **32 Claims**

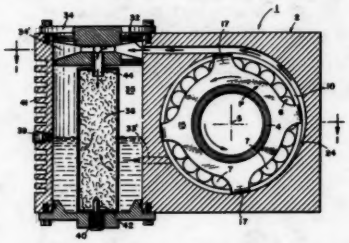
1. An apparatus for controllably circulating liquid lubricant through a bearing supporting a rotating shaft, comprising:

a pressure pump mounted on said shaft adjacent to said bearing and being powered by said shaft to create a pumping action;

said pump having a discharge outlet in fluid communication with one side of said bearing; and

a liquid lubricant filter coupled to said discharge outlet of said pump, whereby when said shaft is rotating, said pump raising the pressure of said liquid lubricant flowing therethrough by an amount sufficient to maintain liquid lubricant flow across said filter and adequate liquid lubricant suction across said bearing so that, during each full cycle, liquid lubricant flows from said discharge outlet through

said filter, through said one side of said bearing, through and across said bearing, through the opposite side of said



bearing, and returns back to said pump, thereby lubricating and cleansing the contact surfaces of said bearing.

5,150,770

RECHARGE DEVICE, PARTICULARLY FOR DRIVE MECHANISMS FOR EXTENDING AND WITHDRAWING OPERATIVE MEMBERS OF A SPACE VEHICLE

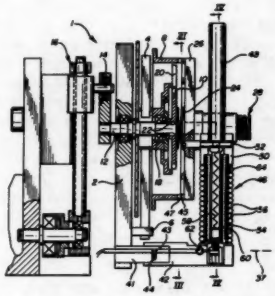
Giovanni Secci, Rome, Italy, assignor to Contraves Italiana S.p.A., Rome, Italy

Filed May 8, 1991, Ser. No. 697,074

Claims priority, application European Pat. Off., Jan. 25, 1991, 91830022

Int. Cl.[5] F03G *1/08*; G05G *17/00*

U.S. Cl. 185—40 R **8 Claims**



1. Recharge device, particularly for spring operated drive mechanism for extending and withdrawing operative members of a space vehicle, comprising a frame having a spring means, said spring means being connected to a shaft, said shaft having an unwinding direction of rotation, in said unwinding direction of rotation said shaft turning for operating a drive mechanism under the action of said spring means, a wheel member having a winding direction of rotation being turned to wind and recharge said spring means, the device further comprising at least one actuator having a shape memory alloy member adapted to rotate said wheel member in said winding direction of rotation for recharging said spring means.

5,150,771

COIL SPRING OR FRICTION-LOCK MECHANISMS

Clyde R. Porter, Los Angeles, Calif., assignor to P. L. Porter Company, Woodland Hills, Calif.

Filed May 11, 1990, Ser. No. 522,210

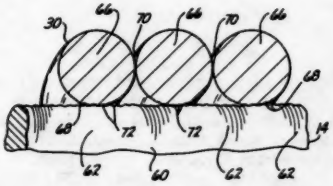
Int. Cl.[5] B65H *59/10*

U.S. Cl. 188—67 **2 Claims**

1. In a mechanical lock of the type having a housing, a cylindrical rod axially slidable through said housing, a coil spring of cylindrical wire helically wound about said rod and having a normal spring internal diameter for engaging the rod surface and thereby locking said rod against movement through said housing, and means for unwinding said coil spring to an unlocking condition, of enlarged internal diameter sufficient to allow sliding movement of said rod, the improvement wherein:

said rod surface has a surface finish characterized by circumferential scoring in the range of 15 to 50 R.M.S.; and

said coil spring has coil surfaces scored longitudinally along the coil windings, the scored surfaces extending less than



180 degrees of arc about the wire axis, said scored coil surfaces facing said rod surface, said coil spring including non-scored sliding contact surfaces between adjacent coils of said spring;

such that interlocking occurs between the rod and coil scored surfaces in said locking condition to enhance locking of said rod against axial movement through said coil spring while preserving low friction contact between adjacent coils for smooth winding and unwinding of the spring during actuation of the lock.

5,150,772

DISC BRAKE CALIPER WITH AN INTEGRAL PROPORTIONING VALVE

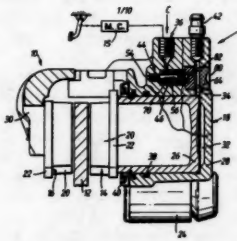
David Pantale, Epinay Surseine, and Eric Schonenberger, Bois Colombes, both of France, assignors to General Motors France, Gennevilliers, France

Filed Dec. 19, 1990, Ser. No. 630,994

Claims priority, application United Kingdom, Jan. 23, 1990, 9001565

Int. Cl.[5] F16D *55/18*

U.S. Cl. 188—72.4 **3 Claims**



1. A disc brake for a motor vehicle comprising:

a rotor;

inner and outer brake pads disposed on opposite sides of the rotor and movable into braking engagement therewith;

a caliper comprising a piston for urging one of the brake pads against the rotor, a caliper housing having a cylinder positioned on one side of the rotor within which the piston is slidably movable under action of fluid pressure in the cylinder, the cylinder defining a single working chamber for the piston, and a fluid line in the caliper for supplying fluid from a fluid pressure source to the cylinder for movement of the piston; and

a hydro-mechanically actuated proportioning valve in the fluid line and integral with the caliper for limiting the fluid

pressure acting on the piston when the fluid pressure from the fluid pressure source exceeds a predetermined level, the proportioning valve comprising a housing which makes a screw-threaded connection with the caliper housing extending into the cylinder of the caliper housing.

5,150,773

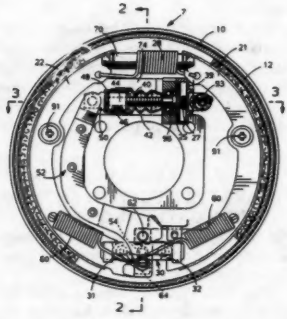
ELECTRICALLY ACTUATED ELECTRIC BRAKE WITH WEAR COMPENSATING ADJUSTER

Gregory M. Hickey, Dayton; Norbert J. Green, Jr., Trotwood, and Michael J. Kozak, West Carrollton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1991, Ser. No. 672,816

Int. Cl.[5] F16D *65/58*

U.S. Cl. 188—79.55 **11 Claims**



1. A vehicle brake having an electrically powered actuator for moving a friction means into contact with a vehicle wheel, the brake having means for adjustment of the brake to compensate for wear of the friction means, the brake including:

an electric motor with a rotor torsionally associated with the actuator to power the actuator for applying the friction means;

a first rotative member torsionally associated with the rotor;

means for returning the friction means from an actuated position to a release position causing the first rotative member to rotate in a releasing direction;

a second rotative member having a first surface to expose to the first rotative member for making torsional transferring engagement with the first rotative member when the first rotative member is rotating in a friction means applying or releasing direction, the second rotative member having a second surface distinct from the first surface only for a non-torsional transferring engagement which is exposed to the first rotative member when the first rotative member has rotated in an applying direction beyond a predetermined limit due to wear of the friction means;

stop means for limiting the rotation of the second rotative member when the first surface of the second rotative member is in torsionally transferring engagement with the first rotative member;

and

means for biasing the second rotative member to expose the first surface of the second rotative member to the first rotative member when the second surface of the second rotative member is exposed to the first rotative member.

5,150,774

WHEELS INCORPORATING BRAKE DISCS

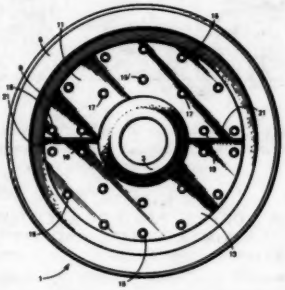
John Adamson, Wirral, England, assignor to Sab Wabco Holdings, B.V., Heerhugowaard, Netherlands

Filed Mar. 8, 1991, Ser. No. 665,791

Claims priority, application United Kingdom, Mar. 10, 1990, 9005421

Int. Cl.[5] F16D *65/12*

U.S. Cl. 188—218 XL **4 Claims**



1. A wheel comprising a central hub and an outer rim interconnected by a web having two oppositely facing sides, a pair of annular braking discs being mounted one on one side of said web and the other on the other side of said web, each annular braking disc being comprised of two curved segments, each segment being secured to said web and to an aligned segment on the opposite side of said web by a number of wide clearance bolts, two close clearance bolts and two further bolts, said wide clearance bolts passing through spaced apart apertures in the radially outer edge regions of said segments and being each a clearance fit both in aligned apertures in the respective segments and in a bore in the web, said close clearance bolts being a close fit both in aligned aperture located in the respective segments on each side of a radial center line midway between the ends of each said segment and in a bore in the web, and said further bolts being a close fit in aligned apertures located in the segments one at each end region of the respective curved segments in the radially inner edge region of the segments, and a wide clearance fit in a bore in the web.

5,150,775

STEER-SENSITIVE VARIABLE DAMPER AND METHOD UTILIZING A RING VALVE

Harlan W. Charles, Harper Woods, and Larry D. Miller, Rochester Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 19, 1991, Ser. No. 810,058

Int. Cl.[5] B60G *17/00*; B62D *6/06*

U.S. Cl. 188—299 **31 Claims**

1. A hydraulic damper for controlling the compression and rebound action of a vehicular suspension spring, the damper comprising:

(a) a reservoir tube connected to a steerable wheel assembly;

(b) an inner cylinder fixedly mounted within the reservoir tube and cooperating therewith to form a reservoir for a damper fluid contained within the reservoir tube and the inner cylinder;

(c) base valve means operatively mounted at one end of the inner cylinder for controlling the flow between the inner cylinder and the reservoir tube;

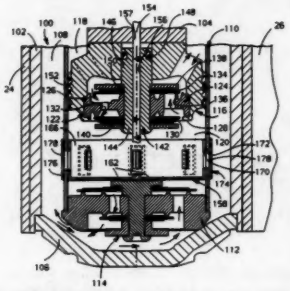
(d) a piston rod operatively mounted for reciprocating movement in the inner cylinder and extending through an upper end of the damper;

(e) a piston secured to an inner end of the piston rod and dividing the interior of the inner cylinder into upper and lower chambers, the piston slidably mounted in the inner

cylinder for both reciprocable and rotary motion with respect to the inner cylinder;

(f) piston valving means in the piston establishing a restricted flow path through the piston between the upper and lower chambers during compression and rebound of the damper;

(g) slit means provided in a portion of the inner cylinder in fluid communication with the lower chamber; and



(h) control valving means establishing a variable flow from the lower chamber to the reservoir through the slit means, the control valving means actuated by the relative rotation between the reservoir tube and the piston provided by a steering motion of a vehicle.

5,150,776

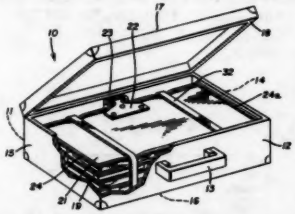
TRAVEL CASE ORGANIZER

Frances S. Rebenack, 2095 Brookshire Rd., Akron, Ohio 44313

Filed Jan. 23, 1991, Ser. No. 644,382

Int. Cl.[5] A45C *13/02, 13/30*

U.S. Cl. 190—110 **5 Claims**



1. A travel case having a top, a bottom, two end walls, a back and an opening front, comprising:

a) C-shaped track means attached to the bottom of the travel case;

b) at least one flat dividing means for separating articles, the perimeter of each dividing means configured to fit neatly into the travel case;

c) lug means attached to each dividing means, each lug means releasably engaging said track means; and

d) said dividing means being roughened by an abrasive material to eliminate the possible movement of articles positioned therebetween.

5,150,777

APPARATUS FOR TRANSMITTING TORQUE BETWEEN THE ENGINE AND THE TRANSMISSION OF A MOTOR VEHICLE

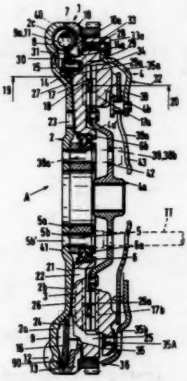
Oswald Friedmann, Lichtenau, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed May 31, 1991, Ser. No. 708,930

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1990, 4041709; May 31, 1990, 4017519; Jun. 29, 1990, 4020759; Aug. 31, 1990, 4027542; Aug. 31, 1990, 4027593; Aug. 31, 1990, 4027614; Aug. 31, 1990, 4027629; Dec. 24, 1990, 4041722

Int. Cl.[5] F16F *15/12*

U.S. Cl. 192—70.17 **67 Claims**



1. Apparatus for transmitting torque in a motor vehicle, comprising a first rotary flywheel connectable with an engine of a vehicle; a second rotary flywheel connectable with a transmission of the vehicle by a clutch, each of said flywheels having a circumference; at least one antifriction bearing between said flywheels; and at least one damper operative to oppose rotation of said flywheels relative to each other and disposed in an at least partly sealed annular chamber which is defined at least in part by at least one of said flywheels, said flywheels having confronting portions disposed radially inwardly of said chamber and defining a clearance, said at least one damper having energy storing elements acting circumferentially of said flywheels and said clutch having a clutch plate adjacent an annular friction surface of one of said flywheels, said friction surface having a radially innermost portion and a radially outermost portion and said chamber having a radially inner portion extending radially inwardly at most halfway between said innermost and outermost portions.

5,150,778

SELF-ALIGNING CLUTCH RELEASE BEARING ASSEMBLY

Eugene A. Wolbers, Northville, and Douglas A. Drewes, West Bloomfield, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

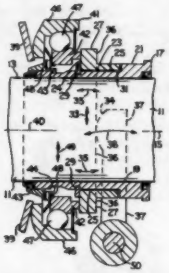
Filed May 31, 1991, Ser. No. 708,539

Int. Cl.[5] F16D *23/14*

U.S. Cl. 192—98 **19 Claims**

1. A clutch release apparatus comprising a carrier sleeve slidable along a sleeve axis, an axially and radially movable thrust plate carried by said sleeve for engagement with a clutch actuator, a self-aligning anti-friction bearing assembly carried by said sleeve in axial alignment with said thrust plate for engagement with an array of clutch release levers, said thrust plate being axially and radially independently shiftable with

respect to said sleeve and with respect to said bearing assembly, said sleeve having a surface spaced radially from said



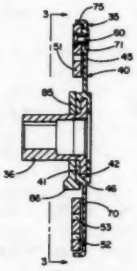
thrust plate so that said thrust plate can move transverse to the sleeve axis without exerting excessive force on said sleeve.

5,150,779

ARMATURE ASSEMBLY FOR AN ELECTROMAGNETIC COUPLING

Dwight E. Booth, Janesville, Wis., assignor to Dana Corporation, Toledo, Ohio

Filed Jan. 14, 1992, Ser. No. 820,344
Int. Cl.[5] F16D *27/07*
U.S. Cl. 192—106.1 **17 Claims**



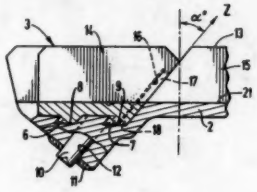
1. An armature assembly for a selectively energizable and de-energizable electromagnetic coupling, said armature assembly comprising a hub having a central axis, a sleeve telescoped over said hub and captivated against rotational and axial movement relative to the hub, web means projecting radially from said sleeve and having first and second axially facing sides, said sleeve and said web means being made of resiliently yieldable plastic, living hinge means integral with said sleeve and said web means and permitting said web means to flex axially back and forth relative to said sleeve, an annular armature disc made of low magnetic reluctance material, said armature disc being spaced radially outwardly from said hub and being secured to said first side of said web means, and spacer means integral with and projecting axially from said first side of said web means and engaging said armature disc to hold said disc in axially spaced relation with said web means.

5,150,780

TREAD ELEMENT FOR MOVING PAVEMENT OR ESCALATOR

Moritz Fischer, Hergiswil, Switzerland, assignor to Fischer Moritz AG, Hergiswill, Switzerland

Filed Mar. 27, 1991, Ser. No. 676,203
Claims priority, application Switzerland, Mar. 28, 1990, 1007/90; Jan. 7, 1991, 0026/91
Int. Cl.[5] B66B *23/12*
U.S. Cl. 198—333 **18 Claims**



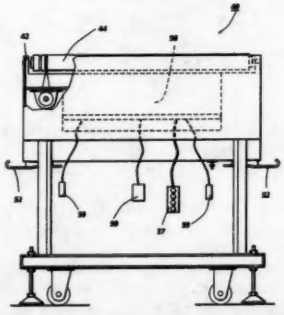
1. Step element for moving walkway or staircase, having a step plate for receiving the persons to be transported, this step plate being provided in the region of at least one of its longitudinal edges with an edge strip secured thereto, wherein the edge strip, of which there is at least one, is provided on its underside, at least along its two longitudinal edges, with a respective tongue, each tongue having a cross section with a shape consisting of one of: a parallelogram with mutually identical angles; and at least approximately a trapezoid, and each tongue engages in a corresponding groove in the step plate in the manner of a tongue-and-groove connection, and wherein this edge strip moreover has on its underside at least two locking pins which are arranged distributed over its length, which extend downwards and through the adjacent step plate, and on whose free ends projecting downwards out of the step plate a respective clamping ring supported under spring-loaded pressure on the step plate are associated with these locking pins being matched to one another such that they permit unimpeded insertion of the tongues of the edge strip into the grooves which are associated with the tongues and are in the step plate.

5,150,781

MODULAR CONVEYOR SYSTEM

Harold G. Deisenroth, and Jeffrey W. Drawe, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 27, 1990, Ser. No. 544,578
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—349.8 **12 Claims**



1. A system for transporting articles, comprising:
a first conveyor unit including first means for sensing the

presence of articles on the first conveyor unit, first means for moving the articles positioned on the first conveyor unit, a first programmable controller mounted on the first conveyor unit in communication with the first sensing means and adapted to regulate the first moving means; and

at least a second conveyor unit attached to the first conveyor unit for receiving articles therefrom and for transporting articles thereto including a second means for sensing the presence of articles on the second conveyor unit, second means for moving the articles positioned on the second conveyor unit, a second programmable controller mounted on the second conveyor unit in communication with the second sensing means and coupled to the first programmable controller for communication therewith, and adapted to regulate the second moving means, the first programmable controller being responsive to communication from the first sensing means and the second controller for regulating the activation of the first moving means to move the articles along a programmable path.

5,150,782

DEVICE FOR POSITIONING BOTTLES SYMMETRICALLY TO THE ROTATIONAL AXES OF BOTTLE CARRIAGES IN LABELING MACHINES AND THE LIKE

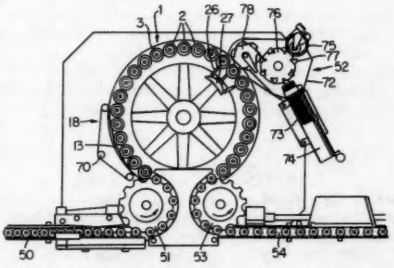
Stefan Richter, Regensburg, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Jun. 5, 1991, Ser. No. 710,794

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1990, 9006376[U]

Int. Cl.[5] B65G *47/24*

U.S. Cl. 198—394 **11 Claims**



1. Apparatus for aligning bottles in a preselected angular position, said bottles having a conical recess and a groove displaced from said recess in their respective bottoms, comprising:

a rotary table for rotating about a vertical axis and a plurality of shafts arranged in a circle about said axis for orbiting with the table, each of said shafts having a bottle carriage mounted thereon including;

a conical bottle centering element and means supporting said element for rotating concentric to the shaft, said element having a shape which is substantially complementary to said conical recess in the bottom of the bottles for registering in said recess,

a bottle support disk having a central opening concentric to said conical centering element and means for guiding said bottle support disk for moving downwardly and upwardly relative to said conical centering element between upper and lower limits,

spring means for urging said bottle support disk toward its upper limit wherein it is substantially flush with said conical bottle centering element such that when a bottle bottom is pressed downwardly on said bottle support disk in opposition to said spring means said support disk lowers to provide for said conical centering element registering in said conical recess for driving said bottle rotationally,

an alignment element and a spring for pressing said element into contact with the bottom of the bottle when said bottle supporting disk is pressed toward said lower limit,

a friction wheel means connected to said conical centering element and rotatable about the axis of said shaft, and

a friction element positioned adjacent said rotating table in a bottle alignment and centering zone for frictionally engaging said friction wheel to rotate said conical centering element until said alignment element latches in said groove in the bottle to hold said bottle in a predetermined angular position.

5,150,783

TUBULAR BELT CONVEYOR

Kunio Hashimoto, Kitakyushu, Japan, assignor to Kabushiki Kaisha Nihon Pipe Conveyor Kenkyusho, Kitakyushu, Japan

Filed Mar. 22, 1991, Ser. No. 673,738

Claims priority, application Japan, Mar. 23, 1990, 2-72175

Int. Cl.[5] B65G *15/08*

U.S. Cl. 198—819 **1 Claim**

1. A tubular belt conveyor, comprising,

an endless belt wound around drive and driven rollers and having upper and lower sections comprising outward and return runs, respectively,

said upper and lower sections being rolled up by deformation means into tubular form substantially along the entire length of said belt such that an object to be conveyed is wrapped in said outward run and conveyed in a wrapped-in state,

supporting frames with horizontal rollers being alternately located along the entire length of said tubular formed sections,

each of said supporting frames having upper and lower passages through which said upper and lower sections are inserted,

a plurality of horizontal holding rollers on said supporting frames; said rollers being located in a central portion between said supporting frames which are juxtaposed so as to support said lower section of said belt orthogonal to said tubularly formed sections, and each of said horizontal holding rollers is pivotally supported on a bracket which is attached to a coupling member of each of said supporting frames in such a manner that the orientation thereof can be varied with respect to a belt running direction,

vertical rollers for supporting curved inner peripheral side portions of said outward and return runs adjacent said horizontal rollers for supporting said sections on transversely curved portions of said outward and return runs,

each of said vertical rollers being pivotally supported on a bracket which is attached to said coupling member of each of said supporting frames in such a manner that the orientation thereof can be varied with respect to the running direction of said belt.

5,150,784

COMBINATION BOTTLE CARRIER AND RACK

Fouad-Michel Sayad, 5360, Cote St. Luc Apartment 4, Montreal, Quebec, Canada H3X 2C4

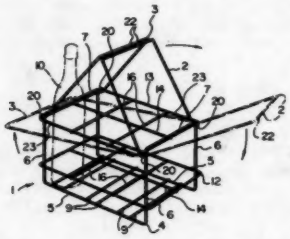
Filed Aug. 16, 1991, Ser. No. 746,347

Int. Cl.[5] B65D *75/00*

U.S. Cl. 206—202 **8 Claims**

1. A combination bottle carrier and rack device comprising

body means for carrying a plurality of bottles, said body means including an open top end, two sides, two ends and a bottom; handle means for carrying the device; stop means extending outwardly from said sides of said body means at the open top end thereof for limiting rotation of said handle means; said handle means being pivotally connected to said stop means for rotation around said stop means from a carrying position above



the open top end of said body means, around one of said ends, around the bottom and around the other end of the body means to a rack position in which said handle means is approximately parallel to the plane of said top end for supporting the body means for use as a rack in a position in which the plane of the top end of the body means defines an acute angle with a horizontal support surface, said stop means preventing rotation of said handle means beyond the rack position.

5,150,785

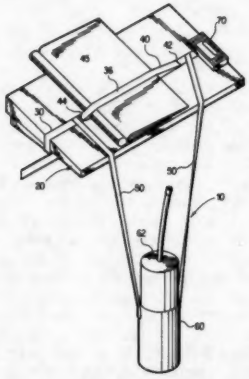
STORAGE CONTAINER

Richard L. Kelley, 666 Columbia Rd., Dorchester, Mass. 02125; Thuan N. Pham, 14 Earle St., Brockton, Mass. 02401, and Kevin J. Kearns, 41 Dartmouth St., Everett, Mass. 02149

Filed Apr. 26, 1991, Ser. No. 691,745

Int. Cl.[5] **B65D** *77/00;* **B42D** *17/00;* **A63B** *21/00, 22/00*

U.S. Cl. 206—217.0 **6 Claims**



1. An Exercise Machine Carry-all for use in combination with an exercise machine console comprising in combination:

a. an exercising machine having a frame, said frame supporting a planar console;

b. first elasticized strap means releasably disposable around said exercise machine console;

c. second strap means attached at an upper end thereof to said first strap means and depending therefrom to a lower end thereof;

d. holder means attached to said lower end to said lower end of said strap means.

5,150,786

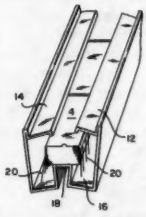
THERMOPLASTIC TUBULAR CONTAINER FOR SEMICONDUCTOR DEVICES WITH LONGITUDINAL OPENING MEANS

Michael J. McAllister, Irving, Tex., assignor to Advanced Dynamics Corporation, Arlington, Tex.

Filed Dec. 31, 1991, Ser. No. 815,386

Int. Cl.[5] **B65D** *73/02, 43/18*

U.S. Cl. 206—328 **6 Claims**



1. A packaging container for semiconductor devices, comprising

(a) an elongated tubular housing defining a chamber within which a plurality of semiconductor devices are arranged, said housing being formed of thermoplastic material for shielding the semiconductor devices from static electricity; and

(b) opening means for opening said housing to permit visual inspection of the semiconductor devices within said housing chamber, said opening means including

(1) a first housing wall containing a longitudinal slit extending continuously between the ends thereof to define separable first wall portions movable between an open position where said wall portions are spaced from one another and a closed position where said wall portions are in contiguous relation; and

(2) a second housing wall arranged opposite said first housing wall and including a flexible portion normally biasing said first wall portions to the closed position.

5,150,787

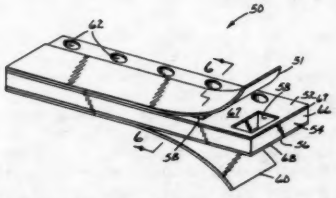
COMPONENT CARRIER TAPE

Gerald C. Bird, Woodbury, and Paul E. Hansen, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 21, 1991, Ser. No. 659,028

Int. Cl.[5] **B65D** *73/02, 75/34, 85/30*

U.S. Cl. 206—329 **8 Claims**



1. In a carrier tape comprising a strip of flexible material having top and bottom major surfaces, a series of spaced openings through the strip of flexible material extending between said major surfaces, and a predetermined thickness between said major surfaces, the size of said openings along said major surfaces and said predetermined thickness being adapted to receive a component between the major surfaces of said strip of flexible material, the improvement wherein the strip of flexible material comprises a layer of nonwoven thermoplastic polymeric fibers, said fibers being adhered together at a sub-

stantial number of the fiber crossover points, and said layer of nonwoven thermoplastic polymeric fibers having in the range of 20 to 70 percent air filled open spaces between the fibers.

5,150,788

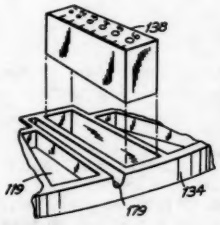
REAMER/WRENCH/POST KIT

Bernard Weissman, 225 E. 48th St., New York, N.Y. 10017

Filed Apr. 1, 1991, Ser. No. 678,785

Int. Cl.[5] B65D *85/24*

U.S. Cl. 206—369 **23 Claims**



1. A dental tool container comprising:

an annular tool holder;

a plurality of primary tool-storage compartments for dental posts which compartments are disposed around the tool holder; one of said primary compartments being elongated to project centrally inwards beyond others of said primary compartments, to provide a reamer compartment to accommodate reamers;

a selector lid rotatably mounted on the tool holder and covering the compartments;

a primary opening in the selector lid for accessing said primary compartments

whereby rotation of the selector lid can register said primary opening with each primary compartment in turn, providing access thereto;

and wherein the tool container further comprises: a secondary tool storage compartment for dental post wrenches which secondary compartment is disposed centrally of the tool holder and surrounded by said primary compartments; and a secondary opening in the selector lid for accessing said secondary compartment;

whereby rotation of the selector lid on the tool holder can bring the secondary opening therein into and out of registration with said secondary compartment to access it.

10. A dental tool kit comprising dental posts and dental post wrenches loaded in a dental tool container which container comprises:

an annular tool holder;

a plurality of primary tool-storage compartments disposed around the tool holder and charged with dental posts;

a selector lid rotatably mounted on the tool holder and covering the compartments;

a primary opening in the selector lid for accessing said primary compartments;

whereby rotation of the selector lid can register said primary opening with each primary compartment in turn, providing access thereto;

and wherein the tool container further comprises:

a secondary tool storage compartment charged with dental post wrenches which secondary compartment is disposed centrally of the tool holder and surrounded by said primary compartments; and

a secondary opening in the selector lid for accessing said secondary compartment;

whereby rotation of the selector lid on the tool holder can bring the secondary opening therein into and out of registration with said secondary compartment to access it.

22. A dental tool container comprising:

an annular tool holder;

a plurality of primary tool-storage compartments for dental posts which compartments are disposed around the tool holder; a perforated platform located within and extending fully across one of said primary tool-storage compartments for the storage of dental reamer stops, the openings through the platform being of a size small enough to prevent passage of a reamer stop but sufficiently large to accept at least the end point portion of a reamer;

a selector lid rotatably mounted on the tool holder and covering the compartments; the perforated platform extending along a plane sufficiently distant from the selector lid to permit the placement of reamer stops in the compartment without interfering with the rotation of the lid;

a primary opening in the selector lid for accessing said primary compartments;

whereby rotation of the selector lid can register said primary opening with each primary compartment in turn, providing access thereto.

5,150,789

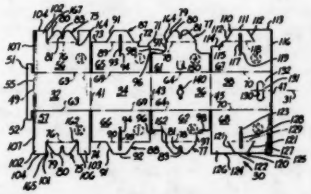
PACKAGE OF ELONGATED STRAND MATERIAL AND CARTON BLANK THEREOF

Benjamin A. Bass, Omaha, Nebr., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 31, 1991, Ser. No. 649,084

Int. Cl.[5] B65D *85/04*

U.S. Cl. 206—396 **23 Claims**



1. A package of coiled, elongated strand material which comprises:

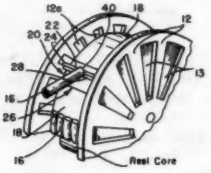
a coil of elongated strand material which is capable of being payed out from an interior of the coil without rotation of the coil; and

a carton in which is disposed said coil, said carton including a plurality of wall panels which confine laterally said coil with each said wall panel having opposed flaps and an associated tab which is located along an edge portion of each of said flaps opposite a hinged connection of the flap to an associated wall panel and with the tabs of the flaps on each of two opposing sides of said wall panels being interlocked to form a member extending into a portion of the coil to facilitate payout of the elongated strand material, and said carton having been assembled from a blank which has a longitudinal axis and which includes said wall panels in interconnected end to end relation in a strip such that said wall panels are connected together with each of flaps associated with each of end ones of said wall panels in said blank having a portion which extends at least to a free outer end of the tab that is associated with each said end one of said flaps and which has an end edge surface that is perpendicular and intersects with to an end edge surface of the blank.

14. A blank from which a carton may be assembled, said blank comprising a plurality of wall panels which are adapted to confine laterally a coil of elongated stand material with each said wall panel having opposed flaps and an associated tab which is located along an edge portion of each of said flaps opposite a hinged connection of the flap to an associated wall panel and with the tabs of said flaps on each of two opposing sides of said wall panel being adapted to be interlocked to form a member to extend into a portion of a coil to facilitate payout of the elongated strand material, said blank including said wall

panels in interconnected relation in a strip with each of said flaps associated with each of end ones of said wall panels in said blank having at least one portion which extends at least to a free outer end of the tab that is associated with each said end one of said flaps and which has an end edge surface that is normal to and intersects with an end edge surface of the blank.

5,150,790
THEFT GUARD FOR CABLE REELS
Sidney M. Forgette, 20 Standish St., Plattsburgh, N.Y. 12901
Filed Jul. 23, 1991, Ser. No. 734,486
Int. Cl.[5] B65D *85/67*
U.S. Cl. 206—4 **15 Claims**



1. A theft guard for a cable reel having a core about which a cable is wound and having opposite radial end flanges with said end flanges having respective confronting recesses therein, comprising:

a flexible belt of a length generally sufficient to wrap circumferentially around a wound cable on a reel core, and of a width generally equal to that of the reel core,

first and second locking means adjacent respective ends of said belt for securement to each other,

said first locking means on one end of said belt being fixed thereto, and said second locking means on the other end of said belt having belt adjustment means for shortening of said belt with respect to said locking means to accommodate the diameter of a reel core wound cable at the time the belt is wrapped therearound, thereby to permit said belt to generally snugly embrace the wound cable and permit said first and second locking means to be in confronting relation irrespective of reel wound cable diameter,

means for securing said first and second locking means together, and,

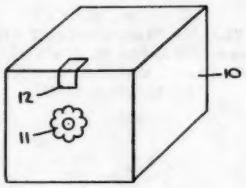
said first and second locking means defining therebetween a generally radial opening through which a cable may generally tangentially extend when said belt is in locked position,

whereby said belt when associated with a reel having a wound cable thereon blocks access to the wound cable to preclude unauthorized unreeling thereof.

5,150,791
COSMETIC COLOR DISPLAY APPARATUS AND METHODS
Melvin E. Kamen, Highlands, and Philip Bernstein, Glen Ridge, both of N.J., assignors to Revlon, Inc., New York, N.Y.
Continuation of Ser. No. 329,659, Mar. 19, 1989, abandoned.
This application Feb. 8, 1991, Ser. No. 652,691
Int. Cl.[5] G09B *19/00*; B65D *73/00*
U.S. Cl. 206—457 **9 Claims**

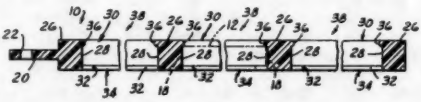
1. A color display module for displaying the color of a cosmetic having a given color formulation, comprising:

a thin planar member of a thermoplastic material having a sample of said cosmetic product uniformly distributed within said thermoplastic material such that the cosmetic product is encapsulated within said thermoplastic material, said sample of said cosmetic product including said



given color formulation, whereby said thin planar member replicated the color of said cosmetic product.

5,150,792
DISPLAY DEVICE FOR COIN CERTIFICATION ENCASEMENTS
David M. Munroe, 18815 Moore, Allen Park, Mich. 48101
Filed May 6, 1991, Ser. No. 695,947
Int. Cl.[5] B65D *85/58*; A45C *11/28*
U.S. Cl. 206—486 **8 Claims**



1. A display device for holding at least one article, each article having predetermined dimensions characterized by a first side, a second side and an edge located between said first and second sides, said display device comprising:

a substantially inflexible mounting frame having at least one seat for releasably holding one said article therein, each seat comprising:

seat sidewalls defining an aperture through said mounting frame, said aperture having a first end and a second end, said seat sidewalls being dimensioned to abuttably receive one said article;

peripheral rim means connected with said seat sidewalls at said first end of said aperture for abuttably engaging the article so as to prevent the article from exiting said aperture at said first end thereof; and

boss means connected with said seat sidewalls at said second end of said aperture for resiliently yielding when one said article is caused to be inserted into said seat and for releasably retaining the article in said seat;

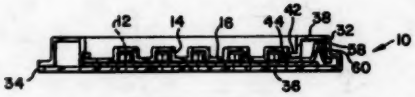
wherein said boss means and said mounting frame are structured so that said boss means resiliently yields while said mounting frame is substantially unflexed when one said article is caused to be inserted into said seat, and said peripheral rim means is structured to abuttably engage the article to prevent the article from exiting said aperture at said first end thereof when the article is located in said seat; wherein further each of said peripheral rim means, said boss means and said seat sidewalls abut one said article so as to interferingly trap the article within said seat, said boss means being structured to extend a substantial length along at least two opposing said sidewalls of said aperture, said boss means being further structured to resiliently yield upon abutment with respect to the article so that the article is pressed into said seat and is pressed out from said seat by a user using only a comfortable amount of force which is substantially less than that which could damage said mounting frame so as to move the article past said boss means.

5,150,793

DEVICE FOR INHIBITING REMOVAL OF AN ARTICLE FROM A BLISTER-TYPE CONTAINER

Michael A. Tannenbaum, Freehold, N.J., assignor to PCI/-Delvco, Inc., Ivyland, Pa.

Filed Oct. 16, 1991, Ser. No. 778,047
Int. Cl.[5] B65D *83/04*
U.S. Cl. 206—531 12 Claims



1. A device for inhibiting removal of an article from a blister-type container, said container comprising a first generally flat sheet having a first side and a second side and a blister for accommodating said article and a puncturable generally flat second sheet having a first side and a second side, said first side of said second sheet engaging a portion of said first side of said first sheet, whereby said article may be removed from said container by applying pressure to an outside surface of said blister to force said article to puncture said second sheet, said device comprising:

a housing surrounding at least a portion of said container, said housing being sized to permit movement of said container between a first position and a second position, said housing having a base positioned facing said second side of said second sheet, said base including a base opening in registry with said blister when said container is in said first position, said base opening being sized to permit passage of said article therethrough; and

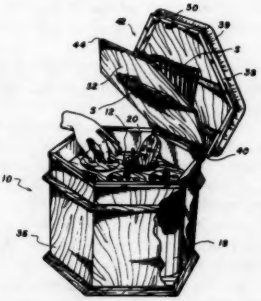
biasing means for biasing said container toward said second position, whereby when said container is in said second position, said base of said housing is positioned facing said second side of said second sheet to inhibit removal of said article from said container and when said container is moved by an individual against the bias of said biasing means to said first position, said blister is in registry with said base opening to permit removal of said article by applying pressure to said outside surface of said blister to force said article to puncture said second sheet and pass through said base opening.

5,150,794

YARN CABINET

George E. Rooks, P.O. Box 368, Penrose, Colo. 81240-0368

Filed Sep. 9, 1991, Ser. No. 756,781
Int. Cl.[5] B65D *85/67;* B65H *75/06*
U.S. Cl. 206—574 11 Claims



1. A yarn storage device comprising:

a cabinet having a partition member disposed therein and defining a lower chamber therebeneath,

said lower chamber including a plurality of cylindrical cavities therein to maintain hanks of yarn,

said partition member having a plurality of openings respectively communicating with each said cavity,

a plurality of lids for enclosing said openings,

said lids provided with a hole therethrough to receive the distal portion of a hank of yarn,

said lids provided with means for retaining said distal portion of a hank of yarn atop each said lid,

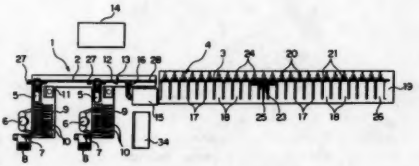
whereby one can gauge what color yarn is contained within each said cavity by observing said distal portion atop said lids.

5,150,795

APPARATUS FOR SORTING SPECIMENS

Naoki Nakayama, Tsukuba, and Katumi Hamasaki, Yokohama, both of Japan, assignors to Mitsubishi Petrochemical Engineering Company Ltd., Tokyo, Japan

Filed Jul. 16, 1991, Ser. No. 730,986
Claims priority, application Japan, Jul. 16, 1990, 2-185191
Int. Cl.[5] B07C *3/14*
U.S. Cl. 209—3.3 3 Claims



1. A specimen sorting apparatus, comprising:

a path of convey including a rack transporting conveyor and a rack sorting conveyor connected to the downstream end of said rack transporting conveyor;

a rack supply conveyor provided at one side of said rack transporting conveyor;

a first specimen bar code reader disposed in the vicinity of said rack supply conveyor;

a printer disposed near the downstream end of said rack transporting conveyor and adapted to operate in accordance with instructions given by a host computer;

a rack bar code reader and a second specimen bar code reader disposed along the path of convey between said rack supply conveyor and said printer;

a table disposed at one side of said rack sorting conveyor and having a predetermined number of storage sections defined thereon; and

a plurality of pusher mechanisms arranged along said rack sorting conveyor and associated with the respective storage sections;

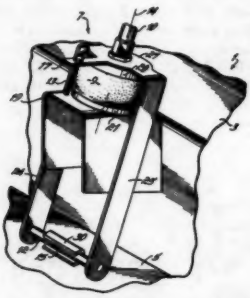
whereby the sorting of specimens is conducted by loading predetermined racks with a predetermined number of specimen containers in accordance with a specimen identification number ID_0No marked on said specimen containers and read by the first specimen bar code reader; transferring the racks onto said rack supply conveyor and then to said rack transporting conveyor; reading the rack identification number of each rack by said rack bar code reader and reading the specimen identification numbers ID_0No of the specimen containers on said rack by said second specimen bar code reader during the running of said rack by said rack transporting conveyor; printing examination item identification numbers ID_2No on said specimen containers by said printer in accordance with instructions given by a host computer; transferring said racks after printing on said specimen containers thereon to said rack sorting conveyor from said rack transporting conveyor; and selectively operating said pusher mechanisms in accordance with instructions given by said host

computer thereby pushing said racks into corresponding storage sections.

5,150,796
RETRACTABLE, AIR PRESSURE ACTUATED HOLD-DOWN CLAMP

Bruce A. Pierson, Cincinnati, Ohio, assignor to Rotex, Inc., Cincinnati, Ohio

Filed Jul. 18, 1991, Ser. No. 732,036
Int. Cl.[5] B07B *1/00*
U.S. Cl. 209—370 **12 Claims**



1. An air pressure actuated hold-down clamp for securing a first member and a second member comprising,

an inflatable air actuator having a fixed end and a movable end, said fixed end mounted to said first member, said actuator being expanded from a normal attitude by internal pressurization and contracted from the normal attitude by sub- atmospheric internal pressure,

a clamping surface provided by said second member,

a clamp arm mounted to a movable end of said actuator, said clamp arm being moved against said clamping surface when said actuator is pressurized thereby to clamp said second member relative to said first member, and

a stop asymmetrically mounted to said movable end of said actuator for movement therewith, contraction of said actuator under sub-atmospheric pressure moving said stop into engagement with a fixed surface, the asymmetric mounting of said stop thereupon tilting said actuator and swinging said clamp arm away from said clamping surface.

5,150,797
IC SORTING AND RECEIVING APPARATUS AND METHOD

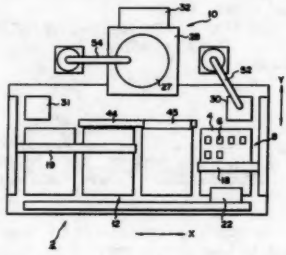
Junichirou Shibata, Urawa, Japan, assignor to Tokyo Electron Limited, Tokyo and Tokyo Electron Yamanashi Limited, Nirasaki, both of, Japan

Filed Jul. 3, 1991, Ser. No. 725,518
Claims priority, application Japan, Jul. 18, 1990, 2-190122
Int. Cl.[5] B07C *5/344*
U.S. Cl. 209—573 **22 Claims**

1. An IC sorting and receiving apparatus comprising:

transportation means for transporting ICs to be sorted and received according to tested results; and

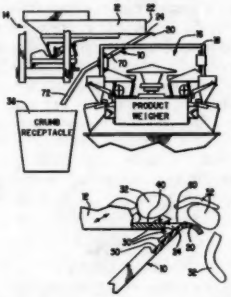
reception means for receiving said ICs transported by means of said transportation means and keeping them in groups according to the tested results, said reception means comprising a vertically movable tray loader having vertical drive means, and a horizontally movable tray loader having horizontal drive means which can be moved in a horizontal direction away from a region over said vertically movable tray loader when said ICs are transported onto said vertically movable tray loader.



5,150,798
CRUMB REMOVAL SYSTEM

William C. Mills, Jr., Dallas, Tex., assignor to Recot, Inc., Plano, Tex.

Continuation of Ser. No. 600,880, Oct. 22, 1990, abandoned.
This application Mar. 3, 1992, Ser. No. 844,870
Int. Cl.[5] B07B *13/05*
U.S. Cl. 209—660 **9 Claims**



1. An apparatus for separating substantially intact products from smaller, partial pieces of the intact products, comprising:

a conveyor means for transporting a product stream in a downstream direction, the product stream comprising substantially intact products and smaller, partial pieces of the intact products, and the conveyor means having a discharge end; and

an inclined chute extending underneath the conveyor means with an upper end of the chute being disposed downstream of and horizontally spaced from the discharge end by a distance forming an opening between the discharge end and the upper end of the chute, the size of the opening being variable and selected so as to allow the passage of the smaller, partial pieces down the inclined chute in a direction opposite to the downstream direction of the product stream and to allow the passage of the substantially intact product over the upper end of the chute in the downstream direction;

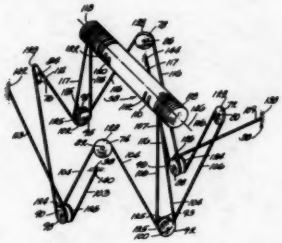
wherein the upper end of the discharge chute comprises a convex curved surface for receiving product discharged from the downstream end of the conveyor means and for preventing damage to the substantially intact products as they pass thereover.

5,150,799

ANTI-SWAY REEVING SYSTEM

Herbert D. Long, Jr., West Allis, Wis., assignor to Harnischfeger Corporation, Brookfield, Wis.

Filed Nov. 5, 1990, Ser. No. 608,876
Int. Cl.[5] B66C *13/06, 17/00, 19/00*
U.S. Cl. 212—147 13 Claims



1. A reeving apparatus for a crane having an overhead frame, winding drum means mounted on the frame for raising and lowering a lifting beam and having a longitudinal axis, and a lifting beam positioned below the frame and subject to swaying forces and movement transverse to the vertical comprising:

first, second, third and fourth spaced-apart rotatable sheave means affixed to and swaying with the lifting beam for supporting and positioning the lifting beam, the first and second sheaves being spaced apart in directions horizontally transverse to the axis of the drum and the third and fourth sheave means being spaced apart from each other and from the first and second sheave means in directions parallel to the axis of the drum means;

alternate ones of the first, second, third and fourth sheave means comprising single sheaves having first and second grooves and the other ones of the first, second, third and fourth sheave means comprising a pair of sheaves each having single grooves;

a plurality of rope means each affixed to the drum means and overhead frame and wrapped around one of the first, second, third and fourth sheave means for supporting the lifting beam with the sheave means;

the plurality of rope means including first and second rope means extending to and wrapping around the same alternate one of the first, second, third and fourth sheave means in one of the first and second grooves for generating friction forces with said alternate one of the sheave means in response to swaying movement which dissipate the energy of the swaying forces on the lifting beam; and

said first and second rope means each extending to and wrapping around a single groove of a pair of sheaves of a different other one of the first, second, third and fourth sheave means for supplying rope to the alternate ones of the first, second, third and fourth sheave means to allow their swaying movement.

5,150,800

TRAINING CAP FOR NURSING BOTTLES

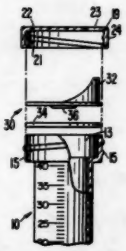
Celia Sarter, and Rick Sarter, both of 24 R St., NE., Washington, D.C. 20002

Continuation of Ser. No. 362,868, Jun. 7, 1989, abandoned. This application Jan. 2, 1991, Ser. No. 635,390
Int. Cl.[5] A61J *9/00, 11/04*
U.S. Cl. 215—11.4 7 Claims

3. In a nursing bottle combination including a nursing bottle having an open end and threads at said open end, and a cap having a top defining an opening and a flange having threads for mating with the threads of a bottle, the improvement comprising:

an insert member receivable in said cap, said insert member having a weaning spout projecting from the insert member and extending through the opening in the top of the cap, the weaning spout including an opening extending through said insert member;

a control member sized for mounting on the open end of the bottle, said control member having an opening being disposed to be registrable with the opening of the weaning spout, and said opening through said insert member including means for movement with respect to the opening of said control member to vary the size of said inlet and



thereby control the rate of fluid flow through the weaning spout; and

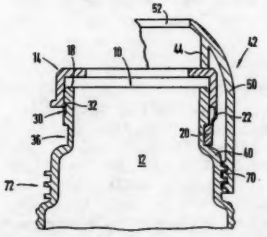
said weaning member having a first axially extending connecting portion and said control member having a corresponding second axially extending connecting portion, wherein said first axially extending connecting portion and said second axially extending connecting portion include means to facilitate the relative rotation between said control member and weaning member.

5,150,801

DETACHABLE CAP FOR A BOTTLE NECK

Wolfgang Held, Holzlutweg 7, A-6972 Hardt, Austria

PCT No. PCT/EP89/00309, § 371 Date Jun. 14, 1990, § 102(e) Date Jun. 14, 1990, PCT Pub. No. WO89/09591, PCT Pub. Date Oct. 19, 1989
PCT Filed Mar. 21, 1989, Ser. No. 499,398
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811730
Int. Cl.[5] A61J *9/08, 11/04*
U.S. Cl. 215—11.6 11 Claims



1. In a baby bottle having a neck with a mouth, and a nipple with a horizontal flange, which is supported by an annular cap that is detachably connectable to the neck, the annular cap being shaped as a portion of a hollow cylinder having a radial flange oriented inwardly, the radial flange pressing and sealing the horizontal flange of the nipple against a face end of the mouth, the improvement comprising:

the annular cap (14) connected with a joint (22) to a retaining body (20) having arcuate legs (24, 26), the arcuate legs (24, 26) of the retaining body (20) detachably snapped within a circumferential annular groove (36) about an outer wall of the neck (12), the arcuate legs (24, 26) to-

gether extending about more than a 180° segment of a neck circumference of the neck (12); and

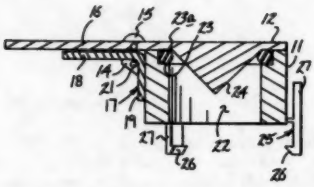
a first side wall of the annular cap (14) diametrically opposed with respect to the joint (22) having an inwardly directed detent protrusion (32) engageable within a correspondingly positioned detent recess (30) within said outer wall of the neck (12) for detachably connecting the annular cap (14) to the neck (12).

5,150,802

PUNCTURE AND SEAL CAP APPARATUS

Christopher M. Jeffers, 1548 Quinif St., Walled Lake, Mich. 48390

Filed Nov. 12, 1991, Ser. No. 790,829
Int. Cl.[5] B65D *51/22*; B67B *7/50*
U.S. Cl. 215—235 5 Claims



1. A puncture and seal cap apparatus for securement to a container, wherein the apparatus includes

a cylindrical cap body, the cap body including a body upper terminal end and a body lower terminal end, the cap body including a conduit bore coaxially directed coextensively through the cap body, and

a lid hingedly mounted to the cap body at the upper terminal end, the lid and the cap body including a hinge to pivotally mount the lid to the cap body, and

the lid including a lid piercing cone fixedly and integrally mounted to an interior surface of the lid, wherein the piercing cone is coaxially aligned with the bore in a first position when the lid is in a contiguous communication with the cap body upper terminal end, and

the container including a container spout, wherein the container spout includes a sealing web mounted to the spout at an upper terminal spout end, and

the spout including an annular flange, and the cap body including a plurality of spring legs for securement of the cap body to the flange.

5,150,803

DECANTER AND LID ASSEMBLY FOR AUTOMATIC DRIP COFFEE MAKER

Mark Cartellone, Rocky River, Ohio, assignor to Mr. Coffee, Inc., Bedford Heights, Ohio

Filed Jul. 25, 1991, Ser. No. 736,062
Int. Cl.[5] B65D *39/10*
U.S. Cl. 215—357 15 Claims

1. An adjustable lid assembly for attachment to a decanter having an interior cavity and an open upper end, comprising:

a mounting sleeve which is attachable to the open upper end of the decanter, said sleeve having

an opening extending therethrough for communicating with the interior of the decanter, and

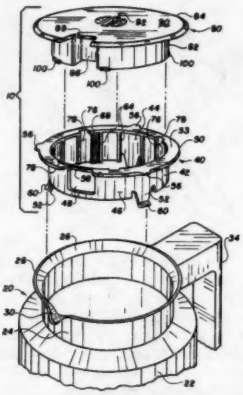
at least one column of vertically aligned, horizontally oriented slots, each of said slots having a side communicating with said opening through said sleeve, and

a generally vertically oriented recess formed in said sleeve adjacent said column, said recess being in communication with said opening through said sleeve and communicating with said slots, and

a lid dimensioned to be telescopically received within said opening in said sleeve and to be rotatable within said sleeve about a fixed axis, said lid having

an upper surface for substantially enclosing the open upper end of the decanter,

a central aperture through said upper surface which communicates with the interior of the decanter when said lid is within said sleeve, and



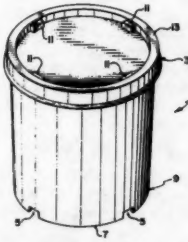
at least one outwardly extending, generally horizontal lug dimensioned to be movable within said recess in said sleeve and to be movable from said recess into one of said horizontally oriented slots when said lid is rotated about said axis.

5,150,804

ROTATIONALLY RESISTIVE PAIL, PAIL SUPPORT AND COUPLING FOR CEMENTATIOUS OR VISCOUS MATERIALS

Oscar Blanchet, 12219-105 St., Edmonton AB, Canada T5G2N9, and Donald Mills, 14518-31 St., Edmonton AB, Canada T5Y121

Filed Mar. 14, 1991, Ser. No. 669,676
Int. Cl.[5] B65D *51/00*
U.S. Cl. 220—212 10 Claims



1. A rotationally resistive pail, pail support and coupling, comprising:

a hollow pail having an opening and a base;

said pail having a lid engaging means in said base of said pail; and,

a mating lid for said pail, separate from said pail for disengageable closure of said pail opening, and for removal from said disengageable closure of said pail opening and placement so as to be releasably engageable with said pail base for supporting and lockingly engaging said pail in a supporting position;

said lid having a pail engaging means for vertical interlocking and rotationally preventative engagement with said lid engaging means when said lid is in said supporting position, wherein:

(a) when said lid is in said supporting position, said lid supports said pail vertically, and said engaging means prevents forced relative rotation between said lid and said pail;

(b) said base of said pail includes a circumferential base rim depending from said pail, and said lid engaging means is at least one notch in said base rim; and

(c) said lid includes a circumferential lid rim circumscribing said lid, and said pail engaging means is at least one lug protruding from said lid rim for mating with said notch.

5,150,805

FLUID SEAL APPARATUS

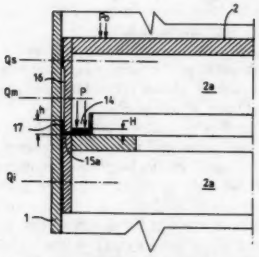
Manuel Vinals, San Quirze del Valles, Spain, assignor to Schlumberger Industries, Montornes Del Valles, Spain

Filed Sep. 19, 1991, Ser. No. 762,146

Claims priority, application France, Sep. 28, 1990, 90 11953

Int. Cl.[5] B65D *88/48*

U.S. Cl. 220—217 **4 Claims**



1. Apparatus for separating a first volume of fluid from a second volume of fluid, said apparatus comprising a substantially vertical cylinder, a piston and a seal, the piston being slidably mounted inside the cylinder and cooperating with a bottom portion of the cylinder to delimit the first volume fluid, the seal comprising a liquid filling an annular space formed between the piston and the cylinder, to provide fluid-tight sealing at this space, wherein the piston has a cavity opening out into the first volume of fluid, and wherein the piston includes at least one reservoir which is subjected to the pressure of the first volume of fluid, which is housed in said cavity, which contains the sealing liquid, and which communicates freely with said annular space via through orifices in the piston, the liquid thereby taking up respective levels firstly in the reservoir and secondly in the annular space, with the difference between these respective levels being a function of the difference between the respective pressures in the first and second volumes of fluid.

5,150,806

REFUSE CONTAINER WITH TWO-POSITION LID

Norman J. Glomski, Chattanooga, Tenn., assignor to The Heil Co., Milwaukee, Wis.

Division of Ser. No. 192,002, May 9, 1988, Pat. No. 4,836,394. This application May 16, 1989, Ser. No. 352,568

The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.

Int. Cl.[5] B65D *90/00*

U.S. Cl. 220—331 **1 Claim**

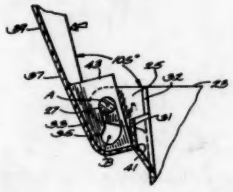
1. A method of uncovering a container for holding refuse or the like comprising the steps of:

a) providing an open top container body;

b) providing a shaft mounted in spaced relation to said container body;

c) pivotally attaching a lid to said body with said shaft extending through one end of a closed slot in said lid;

d) pivoting the lid through an angle of approximately 105° from a closed position to a first open position wherein said lid contacts said body in abutting cooperation to hold said lid in said first open position;



e) translating the lid a predetermined distance in a generally vertical direction to reposition said lid so that the shaft extends through the other end of said slot in said lid;

f) pivoting the lid another approximately 165° from the first open position to a second fully open position.

5,150,807

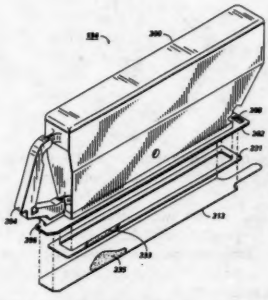
APPARATUS FOR STORING MARKING PARTICLES

Joseph A. Seyfried, Webster, and Chetan G. Patel, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 754,858, Sep. 4, 1991. This application Dec. 6, 1991, Ser. No. 802,977

Int. Cl.[5] B65D *41/00*

U.S. Cl. 220—359 **7 Claims**



1. An apparatus for storing marking particles therein, comprising:

a container defining a chamber for storing the marking particles therein and having an opening defined therein for the discharge of the marking particles therefrom;

a seal member secured to said container, said seal member having an opening defined therein which is at least partially coextensive with the opening of said container for the passage of marking particles therethrough; and

a cover positionable over the opening defined in said seal member, said cover being removably secured to said seal member with an adhesive material.

5,150,808

CAP HOLDER DEVICE

Tyrone Hamilton, 5234 Stuyvesant, Houston, Tex. 77021

Filed Oct. 24, 1990, Ser. No. 602,862

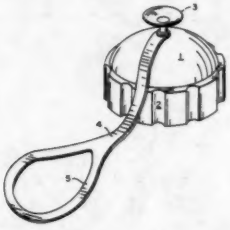
Int. Cl.[5] B65D *55/16*

U.S. Cl. 220—375 **20 Claims**

1. An apparatus for holding a vehicle filler cap comprising:

A. a flexible body with an opening to receive a filler cap;

B. a connector strap assembly that is foldable and attached to said flexible body;



C. means for attaching said connector strap assembly to the vehicle body; and

D. a suction cup to mount said flexible body.

5,150,809

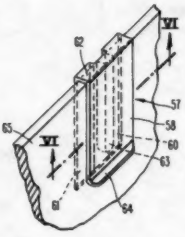
ADJUSTABLE SUBDIVIDABLE MULTI-COMPARTMENT REFUSE CONTAINER

William E. Leigh, 205 Lochwood La., West Chester, Pa. 19380

Filed Apr. 2, 1991, Ser. No. 679,515

Int. Cl.[5] B65D *25/16*

U.S. Cl. 220—404 **17 Claims**



1. An adjustable subdividable multi-compartment refuse container for use with multiple flexible liners, the container comprising:

(a) a base and at least two pairs of opposing side walls extending perpendicularly therefrom, the side walls each having an inner and outer surface, a top edge portion, and a bottom edge portion, the container being open at an end opposite said base;

(b) a plurality of panel retaining means located on the inner surfaces of the side walls;

(c) at least one removable first panel having front and back panel faces, a top edge, a bottom edge, and a pair of side edges, the side edges being held in place by the panel retaining means, the at least one first panel dividing the container into separate multi-sizable compartments;

(d) liner retaining means comprising a plurality of grooves disposed in the top edge portion of at least one pair of opposing container side walls; and

(e) at least one generally U-shaped clip member having a first wall opposing a pair of spaced-apart resiliently movable leg members, each leg member being attached at one end thereof to a connecting wall, the first wall having a tongue portion extending from the connecting wall lengthwise along the inner surface of the said first wall and disposed opposite the space between the leg members, the tongue portion being adapted to be slidably received within any of the grooves, whereby when a liner is placed over any groove, upon sliding receipt of the clip member tongue portion within the groove the liner is secured in place.

5,150,810

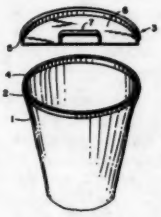
WASTE DISPOSAL BAG WITH A BAG COLLAR AND LID

Johannes Loebbert, Lindenstrasse 22, 4405 Nottuln 2, Fed. Rep. of Germany

Division of Ser. No. 660,964, Feb. 26, 1991, Pat. No. 5,074,500, which is a continuation of Ser. No. 391,230, Aug. 8, 1989, abandoned. This application Sep. 3, 1991, Ser. No. 745,034

Int. Cl.[5] B65D *33/00*

U.S. Cl. 220—404 **8 Claims**



1. In a closable bag suitable for the disposal of trash, garbage and other waste products, said bag comprising:

(a) a bag part made of flexible material having a closed lower end and an open upper end;

(b) a bag collar made of relatively stiff material which is firmly attached to said upper end of said bag part; and

(c) a lid adapted to be placed on said bag collar so as to close and seal said bag at its upper end;

the improvement wherein said collar includes support elements for said lid around its circumference so that the lid can be raised easily or can be placed on or inserted in said bag collar, wherein catch elements are disposed around said bag collar for interlocking with compatible elements on said lid to secure said lid tightly to said bag collar and wherein said lid includes a rim that has a U-shaped cross-section, said rim being adapted to cover the top of said bag collar and to overlap at least part of the inside and outside surfaces thereof, and wherein said catch elements are disposed on at least one of the inside, outside and top of said bag collar, whereby said lid, said bag collar and said bag are disposable as a unit.

5,150,811

SQUEEZE RESISTANT CARTON HOLDER

Henry J. Kelston, 23 Clinton Ave., Nyack, N.Y. 10960

Continuation of Ser. No. 708,153, May 13, 1991, which is a continuation of Ser. No. 594,508, Oct. 9, 1990, abandoned, which is a continuation of Ser. No. 444,918, Dec. 4, 1989, abandoned, which is a continuation of Ser. No. 162,925, Mar. 2, 1988, abandoned. This application Oct. 3, 1991, Ser. No. 771,844

Int. Cl.[5] B65D *6/00*

U.S. Cl. 220—411 **21 Claims**

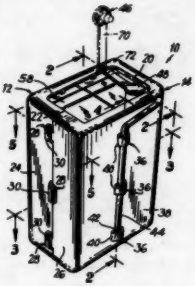
1. A housing of the type capable of receiving a drink-containing flexible carton, the drink carton being substantially a parallelepiped and being of the type having a presealed pierceable opening in its top wall so dimensioned as to receive a straw or the like, said housing comprising:

a) bottom and opposed side wall means defining an interior space for receiving therein the drink carton with the carton top wall at the top of said housing;

b) top means in conjunction with at least one of said side walls and proximate the top wall of the carton; said top means comprising an opening for exposing at least a part of the top wall of the carton such that access may be gained to the straw opening in any number of different locations; and

c) stopper means comprising an arm and a stopper; one end of said arm pivotally coupled to said top means; said stopper being selectively positionable so as to locate and

move into and out of registry with the straw opening; said stopper means when in registry with the straw opening



being insertable into the straw opening for substantially sealing the opening.

5,150,812

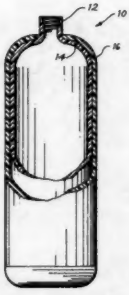
PRESSURIZED AND/OR CRYOGENIC GAS CONTAINERS AND CONDUITS MADE WITH A GAS IMPERMEABLE POLYMER

Peter M. Adams, Charlotte, N.C., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jul. 5, 1990, Ser. No. 548,034

Int. Cl.[5] B65D *25/34*

U.S. Cl. 220—414 **13 Claims**



1. A container or conduit for compressed gas and/or cryogenic gas comprising:

gas barrier means for containing the compressed gas and/or cryogenic gas, said gas barrier means comprising a gas impermeable synthetic polymer, said polymer being selected from the group consisting of liquid crystal polymers, polyacrylonitrile, polyether ketone, polyether ether ketone, polyether ether ketone ketone, high density polyethylene, and ultra high molecular weight polyethylene; and

means for providing structural integrity to the container or conduit, said structural means overwrapping said gas barrier means.

5,150,813

RECEPTACLE AND MOULD FOR MAKING THE SAME

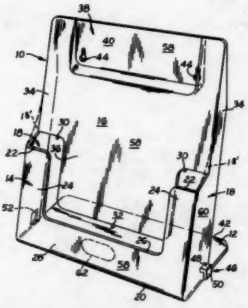
Sydney J. Harris, Berkshire, and Andrew C. Woolnough, London, both of England, assignors to Earley Marketing Limited, Aldermaston, England

Filed Feb. 15, 1991, Ser. No. 656,782

Claims priority, application United Kingdom, Feb. 16, 1990, 9003612

Int. Cl.[5] B65B *5/52*

U.S. Cl. 220—480 **7 Claims**



1. An injection moulded receptacle which is open at the top comprising a bottom, a front wall, a rear wall spaced from the front wall, said rear wall having a lowermost edge spaced from the bottom, and two side walls connecting the front and rear walls at either side of the receptacle, both side walls, or the front wall and both side walls, being connected to the bottom, an upper edge of the front wall being spaced from the bottom by less than the distance of the lowermost edge of the rear wall from the bottom, the rear wall being connected to the side walls only at positions spaced from the bottom a greater distance than the upper edges of the front wall adjacent the side walls.

5,150,814

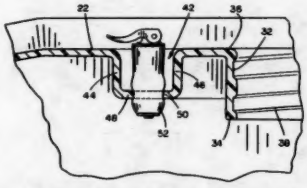
CHEMICAL SPRAY TANK

Craig G. Broyhill, Dakota City, Nebr., assignor to The Broyhill Company, Dakota City, Nebr.

Filed Oct. 9, 1991, Ser. No. 774,717

Int. Cl.[5] B65B *3/06*

U.S. Cl. 220—601 **3 Claims**



1. A chemical spray tank comprising:

a hollow tank member having a bottom wall, front wall, back wall, side walls, and a top wall;

said top wall having a fill opening formed therein for receiving liquid chemicals;

said fill opening being defined by an annular, vertically disposed wall member having upper and lower ends;

the upper end of said fill opening wall member being located at level below the uppermost portion of said top wall;

means for closing said fill opening;

said top wall having an annular recessed area formed therein which extends around said wall member;

said annular recessed area having a bottom wall which is disposed between the upper and lower ends of said fill opening wall member;

said annular recessed area having at least one closable opening formed therein which communicates with the interior of said tank member.

5,150,815

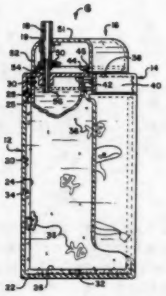
DRINK CONTAINER

Betty E. Saklad, Tarzana, Calif., assignor to Selandia Designs, Santa Clarita, Calif.

Filed Oct. 25, 1991, Ser. No. 782,806

Int. Cl.[5] B65D *47/12*

U.S. Cl. 220—708 **6 Claims**



1. A handheld drink container, comprising:

an open-top, double-walled drink liquid holder including a space sealed between the walls;

a quantity of a liquid received within the holder sealed space;

at least one object received within the holder sealed space and liquid contained therein, said object being movable within said space and liquid upon movement of the container;

a cap removably secured to the holder open top;

a tube extending through an opening in the cap having a first portion extending into the drink liquid holder and a second portion extending generally upwardly and outwardly of the holder;

a sipping straw secured to the tube second portion and extending generally upwardly; and

a cover rotatably secured over the cap and including an upwardly facing opening therein which can be aligned with the sipping straw allowing it to extend upwardly therethrough on rotatable adjustment of the cover to a given angular position, and on the cover being rotated to other positions bending the sipping straw to a condition where liquid cannot leak out.

5,150,816

NON-SPILLABLE DRINKING CUP

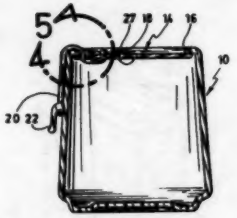
Carlos DeCastro, 8980, Chateauneuf, Anjou, Québec, Canada H1K 4H4

Filed Jun. 24, 1991, Ser. No. 719,348

Int. Cl.[5] A47G *19/22*

U.S. Cl. 220—711 **8 Claims**

1. A non-spillable drinking cup comprising a tubular container adapted to contain a drinkable liquid, said container having an aperture at its top end, said aperture being provided with an internal peripheral flange, a cover for said container, said cover having a top surface adapted to internally and upwardly abut on said flange for closing said aperture, a stretchable member laterally fixed on said container and on said top surface of said cover for resiliently maintaining said cover against said flange, whereby when said container, containing



liquid, is knocked over, the liquid is projected against the cover to enhance the abuting relationship of the cover on the flange.

5,150,817

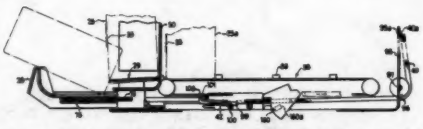
METHODS AND APPARATUS FOR DISPENSING ARTICLES

Troy W. Livingston, Northbrook, Ill., assignor to Inn-Room Systems, Inc., Sudbury, Mass.

Filed Jun. 15, 1990, Ser. No. 539,003

Int. Cl.[5] G07F *11/00*

U.S. Cl. 221—81 **18 Claims**



1. In a vending apparatus for vending a plurality of articles from a plurality of vending units, the combination comprising:

a housing having an access door:

a plurality of vending units in the housing each for vending an article;

a manually actuatable handle associated with each vend unit to be actuated by the vendee to cause a vending of an article;

an upright, substantially semi-cylindrical turnable access door in said vending units rotatable by the handle to turn from a closed position denying access to the article to an open vending position allowing access to the article being dispensed from the upright, substantially semi-cylindrical, turnable access door;

a conveyor means in the vending units for holding a plurality of articles and for conveying each of the articles on the conveyor to the vending position behind the upright, substantially cylindrical, turnable access door; and

electrical control means for disabling the access door to vending and operable by the vendee to enable the vending unit to allow the manually operated handle to be manually actuated to turn the upright, substantially cylindrical, turnable access door to allow removal of the article.

5,150,818

LITERATURE DISPENSING APPARATUS

Paul S. DeMoss, 2921 Lenox Rd. NE., No. 214, Atlanta, Ga. 30324

Filed Feb. 1, 1991, Ser. No. 649,698

Int. Cl.[5] B65H *1/08*

U.S. Cl. 221—228 **3 Claims**

1. A stand for display of advertising messages and dispensing of pieces of literature from a stack comprising the combination of:

an elongated upright cabinet having an internal storage compartment;

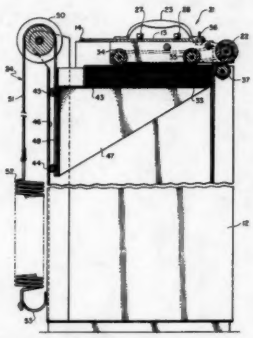
a movable carriage positionable within said storage compartment, in a vertical reciprocal and rectilinear direction so as to move a platform fixed on said carriage within said storage compartment in said vertical direction;

roller means carried on said carriage rollably engaging with an opposing wall surface of said cabinet while permitting stabilized carriage travel through said cabinet storage compartment in said vertical direction;

a stack of literature pieces disposed on said platform having the topmost piece of literature partially exposed in a preparatory position for removal from said cabinet;

a lid movably attached to said cabinet for opening and closing said storage compartment;

resilient means operably coupled between said carriage and said cabinet exteriorly of said cabinet normally biasing and urging said stack of literature pieces in a vertical rectilinear direction towards said lid;



advancement mechanism carried on the underside of said lid in frictional engagement with the uppermost piece of literature whereby manual advancement of said topmost piece of literature from said cabinet moves a secondmost piece of literature underlying said topmost piece into said preparatory position;

means movably mounting said advancement mechanism on said lid to accommodate for misalignment of said literature in a horizontal plane immediately beneath said advancement mechanism;

said cabinet having a dispensing slot immediately ahead of said advancement mechanism through which a portion of said topmost piece of literature is exposed when in said preparatory position; and

said resilient means comprising at least one coil spring having opposite ends connected to said cabinet and said carriage respectively.

5,150,819

DOUBLE TANK PINCH TRIGGER PUMP WATER GUN

Lonnie G. Johnson, 2923 N. Casitas Ave., Altadena, Calif. 91001, and Bruce M. D'Andrade, 3 Ten Eyck Rd., Whitehouse Station, N.J. 08889

Continuation of Ser. No. 680,247, Apr. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 578,145, Sep. 6, 1990, Pat. No. 5,074,437. This application Feb. 28, 1992, Ser. No. 841,762

Int. Cl.[5] A63H *33/18*

U.S. Cl. 222—79 **19 Claims**

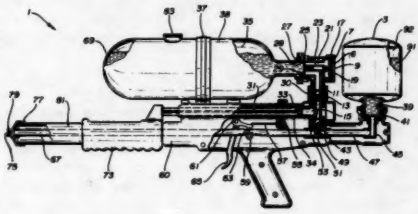
1. A toy water gun having a housing with extending handle, trigger and barrel, said water gun comprising:

(a) a water storage reservoir connected to said housing, said water storage reservoir having at least one orifice formed thereon for the addition and subtraction of water therefrom; and said water storage reservoir having at least one vent to the surrounding ambient air;

(b) a pressurized water storage tank connected to said housing, said pressurized water storage tank having only one orifice through which all liquids and gasses pass;

(c) a pumping means that can selectively draw air or water or a combination thereof from said vented water storage reservoir, depositing same into said pressurized water storage tank to thus vary the ratio of air to water therein;

(d) a plurality of one-way flow valves, wherein at least one of said one-way flow valves prohibits water and air from flowing from said pressurized water storage tank to said pumping means and another at least one of said one-way



flow valves prohibits water and air from flowing from said pumping means to said water storage reservoir;

(e) a nozzle having a narrow orifice therethrough, said nozzle being affixed to the end of said barrel;

(f) an avenue of release connecting said nozzle to said pressurized water storage tank; and

(g) a controlling means for regulating the flow of water and air through said avenue of release, said controlling means being attached to said trigger of said water gun and regulated by the movement of said trigger.

5,150,820

DISPENSING APPARATUS FOR FROZEN PRODUCT

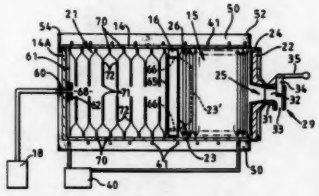
Shane R. McGill, 3 Parrs Head Mews, George Lane, Rochester, Kent, England

Filed Jul. 20, 1990, Ser. No. 556,333

Claims priority, application United Kingdom, Jul. 20, 1989, 8916579; Aug. 24, 1989, 8919216; Jan. 13, 1990, 900792

Int. Cl.[5] B65D *35/28*

U.S. Cl. 222—95 **9 Claims**



1. A dispensing apparatus for dispensing a frozen product which comprises:

deformable container means for containing a frozen product in semi-solid form to be dispensed, said container means having outlet means including an outlet opening in one end of said container means through which the product is discharged;

drive means for deforming said container means whereby to discharge product in said container means through said outlet opening, said drive means being power operated and including:

a plunger engageable with the opposite end of said container means to said outlet opening, and a source of pressurized gas for application to said plunger so that said plunger acts on said container means to deform said container means and discharge said product through said outlet opening;

a housing for receiving said container means, said housing serving to releasably secure said container means during

operation, said housing being formed at one end with a door container an opening through which said container outlet means extends, said door providing an abutment against which said container means is engaged during discharge and said door, when opened, providing access to said housing for replacement of said container means, said door carrying shut-off valve means for controlling discharge of product through said outlet means;

said shut-off valve means includes duct means communicating sealingly at one end with said container outlet means and communicating at the other end with nozzle means through which the product is discharged under the control of said valve means, said shut-off valve means being releasable from said door means to permit cleaning of said shut-off valve means;

said container outlet means being in engagement with said shut-off valve means whereby said frozen product flows directly from said container outlet means to said shut-off valve means and through said shut-off valve means upon actuation of said drive means and opening of said shut-off valve means, said container outlet means extending into said duct means and preventing release of said shut-off valve means from said door means when said door is closed; and

refrigeration means whereby the container means is kept at a low temperature.

5,150,821

APPARATUS FOR SEPARATE INJECTION OF REAGENT

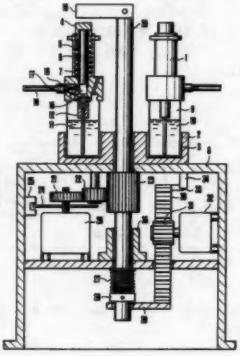
Shuji Iwasaki, Fujisawa; Toshi Kagayama, Yokohama, and Kazuya Kamata, Ebina, all of Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Filed Apr. 6, 1990, Ser. No. 505,399

Claims priority, application Japan, Apr. 7, 1989, 1-88692

Int. Cl.[5] B67D *5/60*

U.S. Cl. 222—132 **4 Claims**



1. An apparatus for selectively injecting a reagent into a reaction chamber comprising:

a plurality of reagent reservoirs, each adapted to contain a different reagent, support means for supporting said reagent reservoirs in a circular configuration, separate dispenser means mounted on top of each reservoir, each dispenser means including a liquid holding chamber, inlet means connected to said chamber and adapted to extend downwardly into a reagent in said reagent reservoir, outlet means connected to said chamber and spring biased plunger means extending into said chamber, dispenser actuating means adapted to be selectively aligned with said plunger means of each dispenser means for selectively depressing and releasing said spring biased plunger means and distribution means connected to said outlet means of each dispenser means for distributing each reagent separately to a reaction chamber,

wherein said dispenser actuating means includes a vertically moveable support rod disposed centrally of said support means for supporting said reagent reservoirs and having horizontally extending lever means adapted to selectively engage said plunger means and drive means for rotating said support rod to selectivley position said lever means above a plunger means and for vertically moving said lever means into and out of engagement with said plunger means.

5,150,822

MIXING HEAD FOR DISPENSING AN ACTINE INGREDIENT

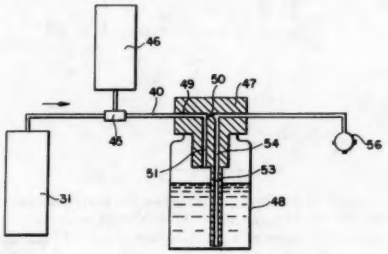
Joseph G. Eitner, Jr., Park Ridge, and Robert J. Tice, Jr., Stockholm, both of N.J., assignors to The Wellcome Foundation Limited, London, England

Continuation-in-part of Ser. No. 428,852, Oct. 27, 1989, Pat. No. 5,020,689. This application Jan. 30, 1991, Ser. No. 647,812

Claims priority, application European Pat. Off., Oct. 26, 1990, 90311754.7

Int. Cl.[5] G01F *11/00*

U.S. Cl. 222—145 **8 Claims**



1. Apparatus for mixing and dispensing an active ingredient comprising

a source of liquid solvent/propellant;

a sample cylinder containing a charge of active ingredient;

a first conduit extending between said source and an inlet of said sample cylinder for connecting said sample cylinder to said source;

a first junction located in said first conduit intermediate said source and said sample cylinder and a second conduit extending from said junction to by-pass said sample cylinder for dividing a flow of said liquid solvent/propellant upstream of said sample cylinder to cause a first portion of said liquid solvent/propellant to flow into said sample cylinder to both absorb and force out said active ingredient and a second portion of said liquid solvent/propellant to by-pass said sample cylinder;

a third conduit extending from an outlet of said sample cylinder to a second junction with said second conduit;

a first flow restrictor interposed in said third conduit intermediate the sample cylinder outlet and the second junction with said second conduit and a second flow restrictor interposed in said second conduit downstream of said first junction and upstream of the second junction with said third conduit, said second flow restrictor being of higher pressure rating than said first flow restrictor for creating a pressure differential between said sample cylinder outlet and said second portion upstream of said second junction to enable total absorption of the active ingredient whereby said active ingredient passes through the outlet and said second portion of solvent/propellent absorbs and propels said active ingredient to a discharge station at which all liquid solvent/propellent vaporizes to discharge a mist of active ingredient particles;

wherein said flow restrictors and said conduits which create said pressure differential are located in a mixing head for said sample cylinder.

5,150,823

COMBINATION CONTAINER AND PUMP HAVING A CONICAL PISTON FOR VENTING

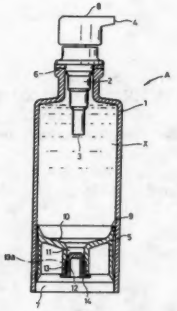
Koichi Sugita, Chiba, Japan, assignor to Kabushiki Kaisha Top, Tokyo, Japan

Filed Oct. 26, 1990, Ser. No. 603,618

Claims priority, application Japan, Oct. 31, 1989, 1-127661[U]; Dec. 26, 1989, 1-149857[U]; Dec. 26, 1989, 1-149858[U]

Int. Cl.[5] G01F *11/00*

U.S. Cl. 222—386 **5 Claims**



1. A combination container and pump comprising:

a cylindrical container for storing a liquid, said cylindrical container having first and second axial ends;

a pump mounted in said first axial end, for drawing the liquid stored in said cylindrical container and discharging the drawn liquid out of said cylindrical container;

a piston slidably disposed in said second axial end for keeping the liquid sealed in said cylindrical container, said piston being movable toward said pump as the amount of the liquid stored in said cylindrical container is reduced when the liquid is discharged from the cylindrical container by said pump;

said piston having a conical surface facing said pump for contact with the liquid stored in said cylindrical container, said conical surface projecting toward said first axial end and having a shape complementary to the shape of an inner surface of said first axial end of said cylindrical container, said piston also having a cylindrical surface defining a communication hole defined axially therethrough and having an inner end opening at said conical surface, said communication hole providing communication between the interior and the exterior of said cylindrical container, said piston having at least one radial slot therein extending from said conical surface to said communication hole, said radial slot having a slanted surface inclined progressively toward said second axial end in a direction opposite to said conical surface; and

a cap comprising a cap body inserted in said communication hole and a flange closing an outer end of said communication hole, at least either one of said cap body and said cylindrical surface having at least one groove extending along the direction in which said cap body is inserted into said communication hole.

5,150,824

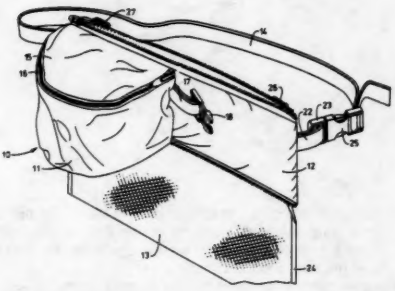
DUAL PURPOSE UNITIZED PACK

Vincent H. Alvarez, and Nancy C. Dendramis, both of Cincinnati, Ohio, assignors to Sally M. Key, Cincinnati, Ohio

Filed Aug. 1, 1991, Ser. No. 739,086

Int. Cl.[5] A45C *15/00*

U.S. Cl. 224—151 **19 Claims**



1. A dual purpose unitized pack capable of use as a container for conveniently holding a limited measure of articles and as a container for holding a relatively substantial measure of articles, said dual purpose unitized pack comprising:

(a) a pouch for holding the limited measure of articles, said pouch having a free first attaching means capable of fastening to a belt;

(b) a substantially flat foldable enclosure member having a contiguous portion permanently attached to the pouch and further having a free portion folded to lie adjacent the contiguous portion in a non-use state and extending from the contiguous portion in an in-use state, said enclosure member having a first closure means along an upper edge and a second closure means along a lower edge and a free second attaching means capable of fastening to a belt;

(c) an open top collapsible sack dimensioned to fit within the enclosure member, said sack attached along one upper edge thereof to an inside wall of the enclosure member and positioned so that a main portion thereof is able to drop out the enclosure member when the second closure means is opened and to serve as a container for holding the substantial measure of articles; and

(d) an adjustable belt attached on one end to the pouch and having mating attaching means at the other end capable of releasably attaching to either of the free first or free second attaching means and capable of being worn around the waist of the user or capable of being worn over the shoulder of the user as desired.

5,150,825

HOLSTER WITH RETENTION DEVICE

Richard E. D. Nichols, 13223 Black Mountain Rd., #357, San Diego, Calif. 92129

Filed Jan. 9, 1991, Ser. No. 639,587

Int. Cl.[5] F41C *33/02*

U.S. Cl. 224—243 **17 Claims**

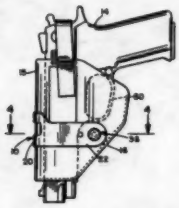
1. A holster for a handgun, comprising:

a holster body having an elongate, handgun receiving pocket extending along its length and open at least at one end for inserting a handgun into the pocket, the holster body having at least one fold and spaced, opposing side wall portions extending from the fold to form opposite sides of the pocket;

an elongate band of resilient material having a hardness greater than the material forming the holster body, the band extending transversely around the outside of at least part of the holster body in a direction substantially perpen-

dicular to the longitudinal axis of the pocket, and having a fold at a central portion in its length overlying said one fold in the holster body and opposite end portions extending over the respective side wall portions of the holster body;

fastener means for connecting opposite ends of the band together and securing the band to the holster body;



the end portions of the band comprising means for pinching underlying side wall portions of the holster inwardly to apply a retentive force to grip underlying portions of a handgun in the pocket; and

opposite ends of the band having aligned openings and said fastener means extending through said aligned openings and the aligned underlying portion of the holster body to secure said band ends to the holster body, said band being secured to the holster body only by said fastener means.

5,150,826

APPARATUS FOR FORMING AND DRIVING STAPLES

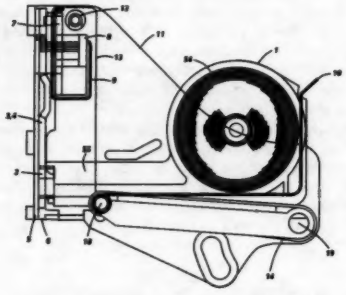
Jozef P. M. Logtens, Meerlo, Netherlands, assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 7, 1991, Ser. No. 666,161

Claims priority, application United Kingdom, Mar. 7, 1990, 9005114

Int. Cl.[5] B25C *5/08*

U.S. Cl. 227—88 **5 Claims**



1. Apparatus for forming and driving staples in a single stroke, comprising:

a removable cartridge storing staple wire;

a first guide plate having a planar surface;

a second guide plate having a planar surface, said second guide plate being spaced apart from, and parallel to the first guide plate to define a guide channel between the planar surface of the first guide plate and the planar surface of the second guide plate and wherein said first guide plate defines a slot;

a former defining a cut-out portion adapted to form staples from the staple wire stored in the removable cartridge;

a forming block having staple wire bent thereabout by the former to produce a staple;

a driver for driving the staple into a workpiece, wherein the former and the driver each comprise a substantially flat plate of equal thickness, with the driver comprising a substantially rectangular plate aligned in the same plane as, and slideable within the cut-out portion of the former, and with both the former and the driver being arranged for coplanar sliding movement in the guide channel;

means for withdrawing the forming block from the staple;

a driving member defining an aperture;

a first link member attached to the driving member; and

a second link member within the aperture of and slideably attached to the driving member wherein the first link member extends through the slot in the guide plate for linking the driving member to the driver and the second link member extends through the slot for disengagingly linking the driving member to the former to initially drive the driver and former in unison to form the staple around the forming block and wherein said second link member is a retractable link member so that at a predetermined point during the driving stroke whereafter the driving member drives only the driver, so that the driver moves relative to the former to drive the staple into the workpiece.

5,150,827

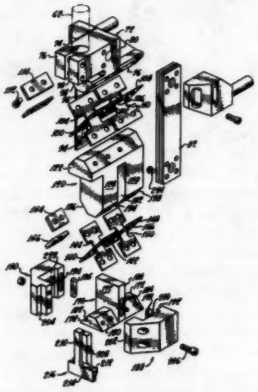
SELF-LEVELING REFLOW SOLDER HEAD WITH DOUBLE PIVOT

William M. Fries, San Diego, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 22, 1991, Ser. No. 796,208

Int. Cl.[5] B23K *3/00, 20/02*

U.S. Cl. 228—44.7 **12 Claims**



1. A self-leveling tool comprising:

a tool tip adapted to be moved in a selected direction to be pressed against a workpiece surface that has an unknown tilt relative to that direction,

drive arm means for moving said tool tip in said direction toward said workpiece, said drive arm means having a pivotal connection to said tool tip, whereby said tool tip tends to tilt upon initial contact with a tilted workpiece, and

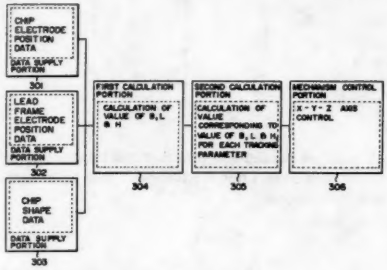
means for mounting said drive arm means to enable lateral motion of said pivotal connection, wherein said means for mounting comprises a drive ram and wherein said drive arm means comprises a double pivot link pivotally connected at one of its ends to said tool tip and at its other end to said drive ram and wherein said pivot connections have mutually different stiffnesses.

5,150,828

WIRE BONDING METHOD AND APPARATUS FOR SAME CAPABLE OF PACKAGING SEMICONDUCTOR DEVICE INTO THIN PACKAGE

Yasuhiko Shimizu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 13, 1991, Ser. No. 791,169
Claims priority, application Japan, Nov. 13, 1990, 2-306451
Int. Cl.[5] H01L *21/90*
U.S. Cl. 228—102 9 Claims



1. A wire bonding method comprising:

a step of calculating the tracking parameters that determine the motion track of a capillary, from a function that has as its variables a tracking wire loop length equivalent to the distance between the bonding point on the lead frame and the bonding point on a chip electrode, and amounts that the chips protrude from the positions of the bonding points on said chip electrode to the side of a lead frame electrode, and

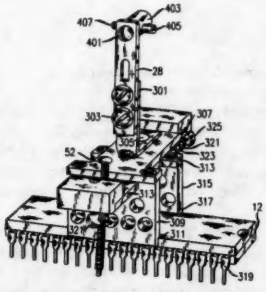
a step of performing drive control of said capillary in accordance with those calculated values.

5,150,829

APPARATUS FOR HOLDING SAMPLES DURING SOLDERABILITY TESTING

Jonathan D. Knepper, Salisbury Township, Lehigh County, and Kenneth P. Moll, Philipsburg, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 19, 1990, Ser. No. 630,465
Int. Cl.[5] B23K *31/12*
U.S. Cl. 228—104 13 Claims



1. An apparatus for holding a smaple for immersion into a solder bath comprising:

a clamping mechanism having a first rod;

a spring circumscribing said first rod;

a first flat plate member, said first flat plate member defining a plane, said plane being generally perpendicular to the longitudinal axis of a first end of said first rod,

a second flat plate member parallel to said first flat plate member, whereby said spring, when compressed, urges said first flat plate member toward said second flat plate member;

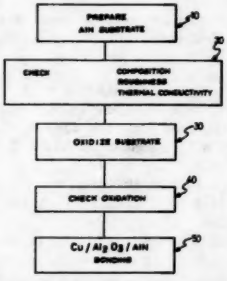
and including means attatched to said clamping mechanism for making electrical contact with said solder bath.

5,150,830

METHOD OF BONDING A SHEET OF METAL, SUCH AS COPPER, ON AN ALUMINUM NITRIDE SUBSTRATE

Jannick Guinet, Soisy Sous Montmorency; Jean-Claude Hubert, Sucy En Brie; Jean Jarrige; Jacques Mexmain, both of Limoges, and Jean-Pascal Michelet, Bessines, all of France, assignors to Telemecanique, France

Filed Feb. 20, 1991, Ser. No. 658,268
Claims priority, application France, Feb. 20, 1990, 90 02029
Int. Cl.[5] B23K *1/20*; C23C *8/12*
U.S. Cl. 228—124 7 Claims



1. A method of bonding a sheet of metal such as copper on a substrate of aluminum nitride, the method comprising the following steps known per se:

i) growing a layer of alumina on the aluminum nitride substrate by means of heat treatment; and

ii) placing the sheet of metal on said alumina layer and then bonding them together;

wherein alumina-growing step i) is performed under a controlled oxidizing atmosphere comprising a water vapor content less than 5 ppm.

5,150,831

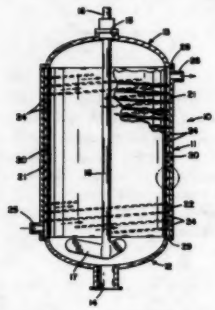
REACTOR VESSEL

Robert E. Jordan, Cleveland, and Michael J. Hughes, Hinkley, both of Ohio, assignors to The B.F. Goodrich Company, Brecksville, Ohio

Division of Ser. No. 344,780, Apr. 28, 1989. This application Apr. 30, 1991, Ser. No. 693,832
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—184 7 Claims

1. A method of making a large capacity closed pressure proof reactor vessel for use in a suspension polymerization process for the manufacture of vinyl chloride comprising the steps of forming an inner cylindrical sleeve from a single continuous sheet of metal with a single lengthwise weld to form such cylindrical sleeve, welding one running edge of a longitudinally extending ribbon into a continuous spiral ribbon to the outer wall surface of said inner sleeve, forming from a single sheet of metal an outer cylindrical shell around said inner sleeve by pressing the inner surface of said shell firmly against the other running edge of said continuous spiral ribbon and thence welding two edges of said outer shell to form a cylindrical shape and forming a continuous spiral flow path around said inner sleeve by the cooperation of said shell and said sleeve with said spiral ribbon, providing an upper cap and a

lower dish like member to said outer cylindrical shell to form said closed pressure proof rector vessel, and providing an inlet



and an outlet port to said reactor vessel that communicates with said spiral flow path.

5,150,832

SOLDER PASTE

Yinon Degani, Highland Park, and John R. Morris, Jr., Cranbury, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 28, 1991, Ser. No. 724,561

Int. Cl.[5] B23K *35/26, 35/363*

U.S. Cl. 228—224 **10 Claims**

1. A process for soldering comprising the steps of printing a solder paste on at least one of a first and second body bringing into close proximity said first and said second body in an oxygen containing ambient, and heating said paste at a reflow temperature characterized in that said paste comprises:

a) a solder;

b) a removing agent for metal oxides;

c) a low temperature component that substantially evaporates below or at said reflow temperature but does not substantially evaporate at room temperature;

d) a high temperature component that prevents reoxidation of said solder and that has a vapor pressure of less than 1 Torr at 180° C.; and

e) a rheological modifier that allows said printing whereby residue remaining after said reflow is substantially avoided or is substantially soluble in an aqueous based medium.

5,150,833

PAPER PACKAGE FOR BEVERAGE

Pi-Lien Hong, 5F-5, No. 245, Pa-Der Road Section 2, Taipei, Taiwan

Filed Mar. 9, 1992, Ser. No. 848,289

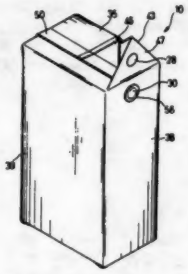
Int. Cl.[5] B65D *5/74*

U.S. Cl. 229—125.15 **2 Claims**

1. A paper package for beverage in the form of a sealed hexahedral package made of a piece of paper material by folding and bonding, in which said hexahedral package having a front panel, a back panel, a left side panel, a right side panel, a top panel, and a bottom panel; said top panel having a first triangular flap and a second triangular flap formed by folding of a part of said top panel and a side panel, each extended from a side of said top panel, and adhered to a side panel; said bottom panel having a third triangular flap and a fourth triangular flap formed by folding of a part of said bottom panel and a side panel, each extended from a side of said bottom panel, and adhered to a side panel; and each of the said triangular flaps consisting of an inner wall and an outer layer covering said inner wall; and characterized by

at least one of the triangular flap having a pour spout opened at the inner wall; and

a protuberance made of soft material slightly greater than the size of said pour spout, adhered on a side panel at a position corresponding to the pour spout to block and seal



said pour spout; and said protuberance remaining adhered to said side panel after the flap with said pour spout has been pulled upwards.

5,150,834

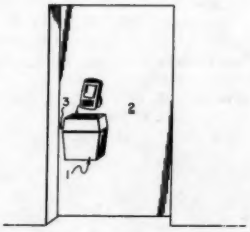
NEWSPAPER DELIVERY BOX

Michael J. Bourke, 16 First Avenue, Ottawa, Ontario, Canada K1S 2G2

Filed Feb. 8, 1991, Ser. No. 652,598

Int. Cl.[5] B65D *91/00*

U.S. Cl. 232—1 C **13 Claims**



1. A newspaper delivery box comprising:

(a) a lower body portion having a bottom and sides:

(b) an upper body portion hinged to the lower portion having a one-way newspaper-receiving slot therein communicating with the interior of the lower portion, said slot being adapted to allow a newspaper to be inserted into the lower portion but substantially preventing removal thereof;

(c) a lock adapted to lock together the upper and lower portions said lock comprising a hook extending from said upper portion engagable with an aperture in the lower portion, said hook being biased towards the aperture; and

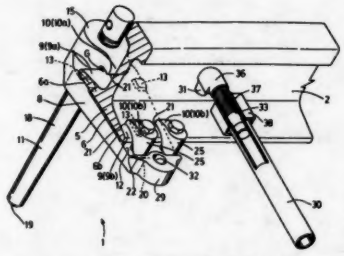
(d) a tether attached to said delivery box and adapted to pass around and be firmly secured behind a closed door, said tether slidably extending within a channel in said box, said channel communicating with said lock aperture, and said tether including lock release means comprising a projection extending from the tether and adapted to engage the hook and urge the hook away from the aperture when the tether is passed through the channel.

5,150,835

RAIL SUPPORT ADJUSTING AND FASTENING DEVICE

Akio Yamamoto, 1602-banchi, Kyoden, Fukui-shi, Fukui-ken, Japan

Filed Oct. 10, 1990, Ser. No. 594,131
Int. Cl.[5] E01B 9/66
U.S. Cl. 238—50 3 Claims



1. A rail support adjusting and fastening device for parallel rails of a directly fastened track which is used to adjust a gage and tilting of the rails prior to laying the track, comprising:

a rail support plate (8) for supporting an under surface (6) of a bottom portion (5) of the rail in a state of a spot support, said rail support plate having at an outer side portion thereof a threaded portion (15) where a screw hole (16) is formed to extend vertically,

a supporting bolt (11) having an upper threaded portion (17) at an upper portion thereof to be threaded with the screw hole (16) and a lower portion of said bolt is formed to be tapered to gradually become more slender downwardly and constructed such that the height of the rail support plate (8) can be adjusted by rotation of the supporting bolt (11),

two spot supporting portions (7) projected from upper outside portions and one spot supporting portion projecting from an upper inside portion of the rail support plate (8) to form points of a triangle so as to support the under surface (6) of the rail bottom (5) at three points on the under surface (6) of the rail bottom, each of said spot supporting portions (7) being provided with rail spot support surfaces so as to form a plane which is tilted to fit a tilting of the rail,

inside and outside spot pressing portions (10) provided with the rail support plate (8) to press the inside portion and the outside portion of the upper surface (9) of the rail bottom portion (5) in the state of spot supporting, said inside and outside spot pressing portions being made rigidly so as not to deform at a time of being pressed by said pressing portions, said inside and outside spot pressing portions being further constructed to press the inside portion and outside portion, respectively, of the upper surface (9) of the rail bottom portion (5) at an intermediate portion between the two spot supporting portions (7) adjacent in a longitudinal direction of the rail and at both side portions of the one spot supporting portion opposite to said two spot supporting portions (7) respectively, such that all three spot supporting portions contact the under surface of the rail bottom portion,

said spot pressing portions (10) for pressing the upper surface (9) of the rail bottom portion (5) at the intermediate portion between the two spot supporting portions adjacent to one another being provided with the rail support plate (8) integrally, and said inside and outside spot pressing portions (10) for pressing the upper surface (9) of the rail bottom portion (5) at both side portions of the one spot supporting portion being constructed to be a movable pressing section,

said movable pressing section including a pair of pressing bolts (27) and pressing members (25),

said each pressing member (25) being provided with a base portion (20) of a semicircle configuration which is engaged with an engaging step (22) formed at an upper surface portion of the inside of the rail support plate (8), and provided with a forward end under surface portion (21) to be in contact with the upper surface (9) of the rail bottom portion, and also provided with an elongated vertically extending bolt hole (23) adapted to receive a pressing bolt therethrough, said rail support plate including pressing bolt screw holes, and

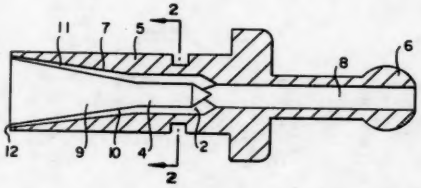
said each pressing bolt (27) being constructed to be screwed with each of said pressing bolt screw holes (26) of the rail support plate (8) through each of the elongated bolt holes (23), so that each of the forward ends under surface portions (21) of the pressing members (25) press the upper surface (9) of the rail bottom portion (5) onto the spot pressing portions.

5,150,836

METHOD OF FUEL INJECTION

Michael L. McKay, Willeton; Ian R. Thompson, Duncraig, and Ralph T. Sarich, Karrinyup, all of Australia, assignors to Orbital Engine Company Proprietary Limited, Western Australia, Australia

Continuation of Ser. No. 526,734, May 22, 1990, abandoned, which is a division of Ser. No. 377,742, Jul. 10, 1989, Pat. No. 4,945,886, which is a continuation of Ser. No. 16,115, Feb. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 694,311, Jan. 24, 1985, abandoned, and a continuation-in-part of Ser. No. 908,963, Sep. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 454,657, Dec. 30, 1982, abandoned. This application Jun. 10, 1991, Ser. No. 711,726
Claims priority, application Australia, Dec. 31, 1981, PF2124; Aug. 31, 1984, PG6875
Int. Cl.[5] F02M 61/02
U.S. Cl. 239—5 17 Claims



1. A method of delivering liquid fuel to an internal combustion engine comprising the steps of:

delivering individual metered quantities of liquid fuel into a conduit communicating with a fixed size constantly open nozzle;

admitting an individual quantity of gas to said conduit immediately upstream of each metered quantity of fuel at a pressure and for a period sufficient to propel the preceding metered quantity of fuel to and discharge the fuel through said nozzle to the engine as an independent fuel pulse, said quantity of fuel in said fuel pulse being independent of the period of admission of gas.

5,150,837

BACKPACK SPRAYING EQUIPMENT

Alberto Ferrari, Gotra di Albareto (Parma), Italy 43051

Filed Jun. 22, 1990, Ser. No. 542,935
Claims priority, application Italy, Jul. 28, 1989, 3570 A/89
Int. Cl.[5] B05B 9/08
U.S. Cl. 239—153 14 Claims

1. Backpack spraying equipment, comprising:

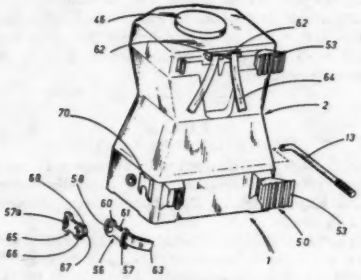
a base;

a tank for holding a liquid to be sprayed, said tank, affording a filler opening uppermost and a first and a second hole at the bottom, said tank being mounted onto and secured to

the base by means that are separable and do not penetrate the tank itself;

a pump system including two piston pumps of identical embodiment associated entirely with the base, the inlet of at least one said pump being connected with the interior of the tank by way of the first bottom hole, and said pumps being mounted for reciprocation in phase opposition;

a single manual control articulated with the base for reciprocating said pumps;



a compession chamber, insertable into the tank by way of the filler opening, and sealably accommodated at bottom by the second bottom hole of the tank, and sealably and removably secured to the base, and connected both to the outlet of the pumping system for receiving output of said pumps in operation and to the tank;

a plurality of elements for seatings to accommodate moving parts of the pumping system, and for connecting the tank, pumping system and compression chamber, said plurality of elements being embodied together with the base as a single unit.

5,150,838

LAWN SPRINKLER SYSTEM

Donel L. Roberts, 1301 Slaughter La., Austin, Tex. 78748

Filed Apr. 13, 1990, Ser. No. 509,324

Int. Cl.[5] B05B *15/06;* **A01G** *25/00;* **F16L** *11/10, 55/02*

U.S. Cl. 239—201 **7 Claims**

1. In a lawn sprinkler system having a water supply line, a sprinkler head, and a length of flexible line connecting said sprinkler head to said water supply line, the improvement comprising:

said flexible line being a preformed flexible line having a first and a second end section and central section;

said first end section and said central section lying in a first plane and defining a first 90° bend in said preformed flexible line;

said second end section and said central section lying in a second plane and defining a second 90° bend in said preformed flexible line; and

said first and said second planes being generally orthogonal to each other,

whereby when said first end section of said preformed flexible line is coupled to said supply line, said central section will lie adjacent to and proximate said supply line and said second end section will be positioned for coupling to said sprinkler head.

5,150,839

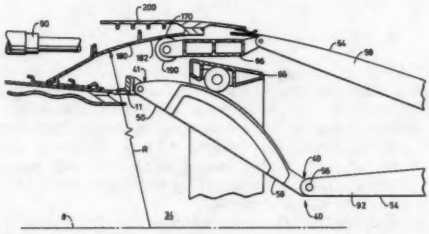
NOZZLE LOAD MANAGEMENT

David V. Reedy, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 14, 1991, Ser. No. 669,242

Int. Cl.[5] B64C *15/02*

U.S. Cl. 239—265.41 **9 Claims**



1. A nozzle flap load path means for an aircraft gas turbine engine having an engine casing and a vectoring nozzle including a plurality of vectorable nozzle flaps, said nozzle flap load path means comprising:

a track mounted to a relatively fixed portion of the engine casing,

a track follower engaging said track and,

a vectoring ring connected to the vectorable nozzle flaps and pivotably connected directly to said track follower and operable to transfer thrust loads from the nozzle flaps to the engine casing.

5,150,840

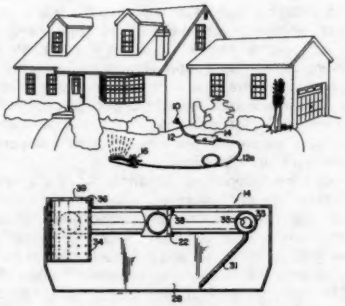
LAWN CHEMICAL DISPENSER

John M. Grynkiewicz, 68 Fox Hill Ln., Enfield, Conn. 06082

Filed Oct. 8, 1991, Ser. No. 772,923

Int. Cl.[5] B05B *7/26*

U.S. Cl. 239—305 **6 Claims**



1. A lawn chemical dispenser for use with a garden hose and sprinkler, said dispenser comprising:

a) a housing having hose fittings at one and an opposite end portion thereof, said fittings being adapted to receive

conventional garden hose fittings, said housing defining a single chamber,

b) a three way valve provided in the one end portion of said housing and having at least three positions,

c) said housing defining at least three passageways, each passageway corresponding with one of said at least three valve positions,

d) two of said at least three passageways communicating with said chamber, a suction tube provide in one of said two passageways for communication between said one of said two passageways and said chamber and a container for dry chemicals interposed in the path of the other of said two passageways,

e) said chamber having an access port for receiving the chemical to be applied to the lawn,

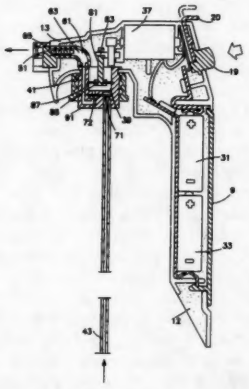
f) of said at least three passageways a third passageway extending in uninterrupted fashion from said valve to said opposite end portion of said housing.

5,150,841

LIQUID SPRAY DISPENSER

Scott A. Silvenis, Midland, Mich.; Paul B. Monaghan, Lexington; Arthur A. Massucco, Natick, both of Mass.; Richard H. Spencer, Winchester, and William R. Gagné, Boston, both of Mass., assignors to DowBrands Inc., Indianapolis, Ind.

Continuation of Ser. No. 7,405,246, Sep. 11, 1989, abandoned.
This application May 23, 1991, Ser. No. 707,256
Int. Cl.[5] B05B *9/04*
U.S. Cl. 239—332 **3 Claims**



1. A process of dispensing a spray or stream of a liquid cleaning product comprising the steps of:

providing a hand held dispenser comprising;

a container for a liquid,

a dispensing nozzle assembly, said nozzle assembly including an outlet,

a screw-shaped structure within said nozzle assembly to impart a swirl motion to a liquid passing therethrough,

a cyclical pump for pumping said liquid from said container to said nozzle assembly, said pump being in communication with an electrical motor for driving said pump,

a flexible tube in liquid flow communication between said pump and said nozzle assembly for conducting liquid therethrough and for absorbing energy from said liquid as it is pumped and subsequently releasing said energy to said liquid,

cyclically pumping said liquid from said container to said nozzle assembly at a pressure differential of less than 45 pounds per square inch gauge, said liquid passing through said flexible tube during one part of said cycle imparting energy to said flexible tube and during another part of said cycle receiving energy from said flexible tube;

said liquid contacting said screw-shaped structure within said nozzle assembly with sufficient energy to create a turbulent flow adjacent said screw-shaped structure to pass through said outlet with said swirl motion imparted thereto;

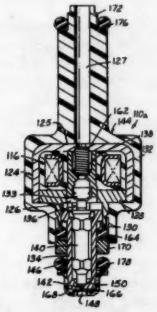
said flow of liquid passing through said outlet having a moderated cyclical velocity due to the absorption and release of energy by said flexible tube.

5,150,842

MOLDED FUEL INJECTOR AND METHOD FOR PRODUCING

John C. Hickey, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 19, 1990, Ser. No. 615,835
Int. Cl.[5] B05B *1/30*
U.S. Cl. 239—585.4 **9 Claims**



1. An electromagnetic fuel injector, comprising:

a magnetic core comprised of a magnetic permeable material having an axial cavity and axial opening;

an electric oil assembly adapted for positioning within said magnetic core cavity and for coupling magnetic energy to said magnetic core;

molded means comprised of injection molded plastic for permanently positioning said magnetic core around said coil assembly and for forming a fuel passageway through said coil assembly and through said magnetic core opening, said molded means also hermetically sealing said coil assembly from said fuel passageway;

an armature comprised of a magnetic permeable material coupled to said fuel passageway and magnetically responsive to said magnetic cores; and

valve means communicating with said fuel passageway and mechanically responsive to said armature for controlling fuel flow in response to application of electrical energy to said assembly.

5,150,843

APPARATUS AND METHOD FOR PROCESSING SOLID WASTE

Charles R. Miller, Houston; Haskell B. Berry, Jr., Channelview, and Tod S. Johnson, Clear Lake Shores, all of Tex., assignors to Premier Medical Technology, Inc., Houston, Tex.

Filed Jan. 9, 1991, Ser. No. 639,214
Int. Cl.[5] B02C *18/22*
U.S. Cl. 241—27 **19 Claims**

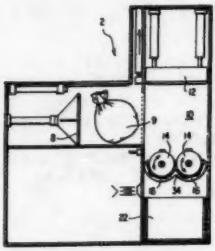
1. A method of grinding waste material comprising:

passing the waste material into a chamber;

grinding the waste material between two cutting heads rotating in opposite directions, said cutting heads compris-

ing alternating cutting blades and spacers, each of said cutting heads interdigitating closely with the other,

grinding the waster material between said alternating cutting blades and spacers and alternating grooves sized to interdigitate closely with said cutting blades and spacers formed in a pair of curved doors located below said interdigitating cutting heads for releasing the ground waste material,



circulating all of said waste material being ground between end surfaces of said cutting blades and spacers of said two interdigitating cutting heads spaced away from each other and from cooperating surfaces of said grooves in said pair of curved doors only sufficiently to allow said waste material to circulate between said cutting heads and said grooves in said doors;

opening the curved doors;

removing the waste material from said chamber through the opened doors.

5,150,844

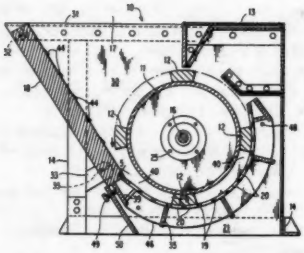
APPARATUS FOR SIZE REDUCTION OF HEAVY SOLID WASTE MATERIALS

R. Thomas McKie, Boise, Id., assignor to Shanley and Baker, Washington, D.C.

Continuation-in-part of Ser. No. 927,313, Nov. 4, 1986, abandoned. This application Jan. 23, 1989, Ser. No. 300,349

Int. Cl.[5] B02C *12/284*

U.S. Cl. 241—73 **15 Claims**



1. Rotary-type apparatus for carrying out a plurality of size reduction actions, including impact fragmentation, crushing, cutting and shearing of heavy feedstock, comprising

(A) housing means defining

a feedstock inlet,

an outlet for finished product, and

a working chamber,

(B) unidirectional rotation rotor means,

such rotor means being mounted for solely unidirectional rotation within such working chamber for providing such plurality of size reduction actions on feedstock during each such unidirectional rotation of such rotor means,

such rotor means including

a drum presenting an external surface symmetrically disposed with relation to a centrally-located axis of rotation for such rotor means, and

impact-cutter bar means in a fixed positional relationship projecting from such drum external surface so as to maintain a fixed uniform diameter cylindrical-configuration peripheral path for such impact-cutter bar means during such rotation of such rotor means, and

(C) a plurality of work surface within such working chamber, including:

(i) an extended-area substantially-planar work surface presented by anvil means which can be selectively positioned in angled relationship with the peripheral path of rotation of such impact-cutter bear means to define a confined space between such anvil means work surface, such drum exterior surface and such peripheral path of such fixed impact-cutter bar means during rotation of such rotor means,

such anvil means work surface and rotor means coating to provide

size reduction by impact fragmentation of frangible feedstock impelled by such rotor means against such anvil means work surface, and

size reduction by a cutting and/or crushing action of other feedstock to form intermediate work product by coaction in such confined space between such anvil means work surface and such drum external surface and/or the impact-cutter bar means of the rotor means as the peripheral circumferential path of rotation defined by rotation of such drum and impact-cutter bar means approaches and passes in contiguous relationship to such anvil means work surface; and

(ii) an apertured grate surface presented by grate means for providing additional size-reduction by coaction between such rotor means and grate means,

such grate means circumscribing a major portion of such peripheral circumferential path of rotation of such impact-cutter bar means,

such portion circumscribed by such grate means being located subsequent to such anvil means in such direction of rotation of such impact-cutter bar means in passing contiguous to such anvil means work surface so as to define a zone which is between at least a portion of the drum surface and such grate means for carrying out such additional size reduction of intermediate product,

such grate means working surface confronting the interior of such working chamber with spacing between such circumscribing portion of the grate means working surface and such peripheral path of the impact-cutter bar means being controllably fixed during size reduction operation of the rotary-type apparatus,

such grate means presenting apertures which extend through such grate means from such working chamber to such outlet for finished product and which are positioned such that rotation of such rotor means drives intermediate product into such grate apertures,

such apertures having a cross-sectional configuration facilitating a shearing action along such peripheral circumferential path of rotation of such impact-cutter bar means,

such shearing action taking place on intermediate product being held by such grate apertures and protruding into such working chamber by passage of such impact-cutter bar means contiguous to such grate means working surface with such shearing action causing release of sheared product enabling passage through such apertures toward such outlet for discharge of finished product.

5,150,845
DEVICE AND METHOD FOR AUTOMATICALLY CONNECTING THE YARN TO THE TUBE OF A WINDING MACHINE

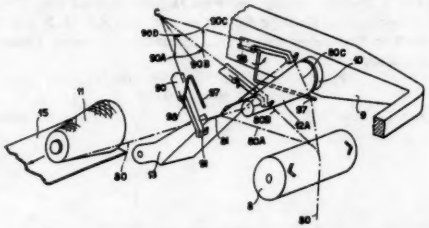
Luigi Colli, and Roberto Badiali, both of Pordenone, Italy, assignors to Savio S.p.A., Pordenone, Italy

Continuation-in-part of Ser. No. 483,320, Feb. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 155,211, Feb. 12, 1988, abandoned. This application Sep. 23, 1991, Ser. No. 764,980

Claims priority, application Italy, Feb. 27, 1987, 19509 A/87

Int. Cl.[5] B65H *67/04*

U.S. Cl. 242—35.5 A **6 Claims**



1. A device for automatically connecting yarn from a bobbin to be discharged, wherein the bobbin is held between a fixed holding center and a mobile holding center on bobbin support arms of a winding machine, to a new tube of said winding machine, and wherein the device has an arm to which members are attached which are able to rotate in two planes which are substantially mutually orthogonal, wherein the device comprises:

a member to seize the yarn connected to said arm of the device to seize the yarn from the bobbin to be discharged; and

a member for positioning the yarn connected to said arm of the device for positioning the yarn onto the new tube;

a yarn cutting member connected to said arm of the device to separate the yarn wound to the bobbin to be discharged from the yarn to be connected to the new tube; and

a tube rotating member connected to said arm of the device to wind initial turns of the yarn on the new tube including a motor driven belt slidable between two pulleys which are supportable by an arm able to descend in a plane orthogonal to the tube axis to bring said belt into engagement to rotate said tube.

5,150,846
UNIVERSAL DEVICE FOR WINDING CORDS, CABLES AND SUCHLIKE

Henri Giust, Trezzano Sul Naviglio, and Ennio Cippelletti, Roma, both of Italy, assignors to Somfy, Cluses, France

Filed Jul. 5, 1990, Ser. No. 548,095

Claims priority, application Italy, Jul. 17, 1989, 21444/89[U]

Int. Cl.[5] B65H *75/24, 75/28, 75/02*

U.S. Cl. 242—54 R **4 Claims**

1. A winding device which can be used in a variety of installations for winding a plurality of traction elements, said traction elements including cords or cables, comprising:

a substantially cylindrical box, said box having a longitudinal lengthwise slot,

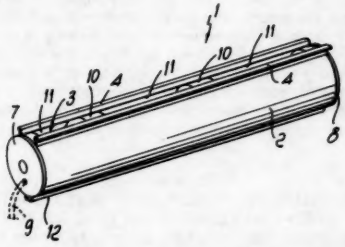
a winding drum within said box onto which said traction elements can be repeatedly wound and unwound, said winding drum being rotatable within said box, the difference between the inner diameter of said box and the outer diameter of said drum is substantially equal to twice the diameter of said traction element to force each said traction element to wind itself onto said drum in adjacent coils without said coils lying on top of each other;

said traction elements being able to wind themselves around said drum by passing through said slot,

a motor to rotate said winding drum,

a pair of end supports closing the ends of said box and supporting said winding drum for rotation,

a plurality of removably adjustable lock and associated guide means within said box and slidable on said drum to guide and lock said traction elements on said drum, each of said lock and guide means consists of a ring and an



associated lock wherein said ring can be releasably locked onto said drum in any desired position by its associated lock and is able to receive and lock the end of a traction element, the outer diameter of said ring being substantially equal to the inner diameter of said box,

whereby the positions of said lock and guide means adjustably determine the number and length of said traction elements that can be accommodated for each installation of the winding device.

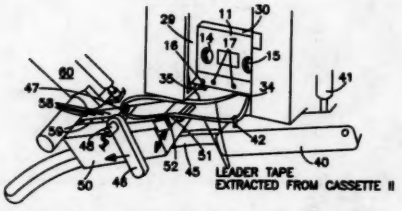
5,150,847
CASSETTE LOADER WITH LEADER TAPE EXTRACTION AND TRANSFER, AND METHOD

Robert I. Farrow, and Drey Johnson, both of Burlington, N.C., assignors to Concept Design, Graham, N.C.

Filed Nov. 6, 1990, Ser. No. 609,589

Int. Cl.[5] B65H *23/04*

U.S. Cl. 242—56 R **11 Claims**



1. A cassette loader for loading a length of magnetic tape into a cassette having a relatively short length of leader tape pre-loaded into the cassette and attached by opposite ends to respective first and second cassette hubs, said cassette loader including transfer means for transferring a length of leader tape extracted from the cassette at a leader tape extracting position on the loader to a splicing block on the loader for splicing to a length of magnetic tape, said transfer means comprising:

(a) a transfer arm mounted for movement on said cassette loader;

(b) leader tape guide means carried by said transfer arm for holding an extracted loop of leader tape;

(c) movement means for moving said transfer arm in an arc between the leader tape extracting position at one side of the splicing block and a leader tape delivery position on the loader being at a point past the opposite side of the splicing block remote from the leader tape extracting

position to deliver the leader tape to the splicing block for splicing, and returning the transfer arm to the leader tape extracting position;

(d) wherein said splicing block includes a planar splicing surface for supporting the tape during splicing, and wherein said planar splicing surface defines a plane, an extension of which plane is:

(i) above the leader tape guide means of the transfer arm when the transfer arm is at the leader tape extracting position and when the transfer arm is at the leader tape delivery position; and

(ii) below the leader tape guide means of the transfer arm when the transfer arm is moving over the splicing block with the loop of leader tape to cause the loop of tape to be wrapped over the splicing block and thereby securely placed in contact with the splicing surface along the length of the splicing block as the leader tape is carried from the leader tape extracting position on the loader to the leader tape delivery position on the loader.

5,150,848

RE-REELING MACHINE WORKING AT CONSTANT SPEED AND RELATED CUTTING DEVICE

Alberto Consani, Viareggio, Italy, assignor to Alberto Consani S.p.A., Borgo A. Mazzano, Italy

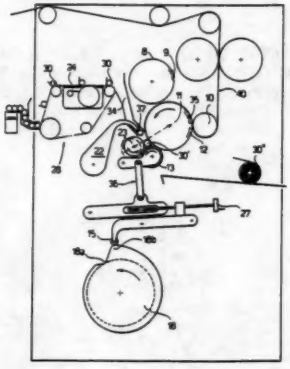
PCT No. PCT/IT89/00066, § 371 Date Feb. 4, 1991, § 102(e) Date Feb. 4, 1991, PCT Pub. No. WO90/04561, PCT Pub. Date May 3, 1990

PCT Filed Oct. 12, 1989, Ser. No. 613,679

Claims priority, application Italy, Oct. 21, 1988, 22390 A/88

Int. Cl.[5] B65H *18/20, 19/26*

U.S. Cl. 242—56 R **6 Claims**



1. A re-reeling machine for re-reeling sheet material on a core comprising:

a plurality of rollers suitable for making a sheet material advance at a constant speed;

said plurality of rollers including

a conveyor roller on which said sheet material is partially wound,

a winding roller, said winding roller being movable to accommodate the increasing diameter of the core as the sheet material is wound thereon, and

a transfer roller which cooperates with said conveyor roller and said winding roller during the winding of the core, said transfer roller being disposed upstream of said winding roller and displaceable with respect to said conveyor roller to allow insertion of the core in a space formed between said rollers; and

means for inserting successive cores in the space formed between said rollers;

wherein said conveyor roller and said winding roller rotate at a first constant peripheral speed equal to an advancing speed of the sheet material, and said transfer roller rotates at a second constant peripheral speed which is lower than said first constant peripheral speed so as to facilitate introduction of a successive core in the space formed between said rollers.

5,150,849

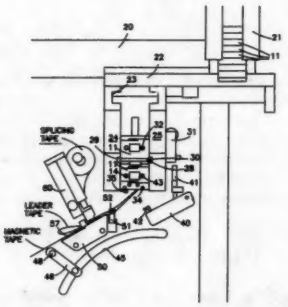
CASSETTE LOADER WITH IMPROVED LEADER TAPE EXTRACTION AND METHOD

Robert I. Farrow, Burlington; Paul DeMint, Snow Camp; Drey Johnson, Elon College; Robert Gaude, and Ray O. McNeill, both of Burlington, all of N.C., assignors to Concept Design, Graham, N.C.

Filed Nov. 6, 1990, Ser. No. 609,752

Int. Cl.[5] B65H *19/30*

U.S. Cl. 242—56 R **4 Claims**



1. A cassette loader for loading a length of magnetic tape into a cassette having a relatively short of leader tape preloaded into the cassette and attached by opposite ends to respective first and second cassette hubs, said cassette loader comprising:

(a) a leader equalization position;

(b) leader type equalization means for winding the leader tape onto one of the cassette hubs while the cassette is in the leader tape equalization position;

(c) a leader tape extraction position for holding a first cassette;

(d) leader tape extraction means for extracting the leader tape from the first cassette in preparation for splicing the leader tape to a length of magnetic tape;

(e) a cassette loading position spaced-apart from said leader tape extraction position for loading a length of magnetic tape into a second cassette the leader tape of which has previously been spliced to the magnetic tape in said leader tape extraction position, wherein said leader tape extraction position is horizontally spaced apart from said cassette loading position;

(f) cassette loading means for loading a length of magnetic tape into the second cassette at the cassette loading position simultaneously with the operation of the leader tape extraction means on the first cassette in the leader tape extraction position;

(g) transfer means for transferring successive cassettes from said leader tape extraction position in said cassette loading position; and

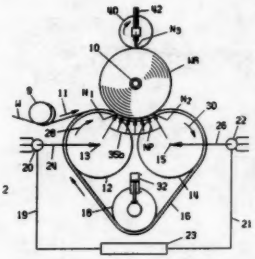
(h) ejection means for ejecting cassettes loaded with magnetic tape from the cassette loading position to permit loading of another cassette for loading.

5,150,850

METHOD FOR WINDING A TRAVELING WEB ON A BELTED TWO DRUM WOUND WEB ROLL WINDER

Richard J. Adams, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed May 10, 1991, Ser. No. 698,034
Int. Cl.[5] B65H *18/22, 20/06*
U.S. Cl. 242—66 4 Claims



1. A method for winding a traveling web into a wound web roll supported on a two-drum type of winder wherein two winder drums are disposed on either side of the wound web roll, comprising the steps:

1) mounting a looped belt about the two winder drums to provide a wound web roll receiving and supporting span between the winder drums;

2) controlling the belt tension in the span by utilizing a control means for selectively producing graduated transitions between conditions of full tension, intermediate tension and tension relief of the looped belt about the winder drums;

3) actuating the control means to relieve the belt tension to provide a core-receiving depression in the belt in a notch between the winder drums;

4) depositing a core in the core-receiving depression and maintaining the core in nipping engagement with both winder drums through the belt;

5) bringing the end of the traveling web into wrapping engagement with the core to initiate the winding of the web into a wound web roll;

6) driving the winder drums to continue the process of winding the web into a wound web roll;

7) bringing a rider roll into nipping engagement with the wound web roll substantially simultaneously with the beginning of the driving of the winder drums.

5,150,851

CLUTCH FOR TAPE DISPENSER

Cristoph Manusch, Hemmingen, and Hans-Jurgen Harp, Hanover, both of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 431,608, Nov. 3, 1989, abandoned. This application Feb. 2, 1991, Ser. No. 653,853
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1988, 8813861[U]
Int. Cl.[5] B65H *75/34*
U.S. Cl. 242—68.1 16 Claims

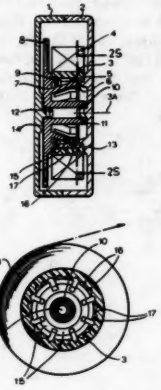
1. A tape dispenser comprising:

a housing;

a reel core rotatable in the housing about an axis and having an inner periphery formed with an annular array of inwardly directed core teeth;

a drive wheel rotatable in the housing about the axis;

a plurality of elastically deformable and axially elongated spring tongues formed unitarily with each other and each extending at an acute angle to the axis from a respective inner end fixed to the drive wheel to a respective outer end lying within the reel core adjacent the inner periphery thereof and offset axially from the respective inner end, each inner end being axially offset and radially inwardly offset from the respective outer end, each outer end being integrally formed with at least one tongue tooth engaging between the core teeth; and



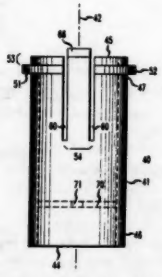
a supply of tape wound on the reel core, whereby when the tape is payed out or wound up on the reel core it rotates relative to the drive wheel and the core teeth move angularly relative to the tongue teeth with elastic inward deflection of these tongue teeth.

5,150,852

PAYOUT TUBE WITH IMPROVED LOCKING MEANS

Rodney J. Hunt, Omaha, Nebr., and Ruloff F. Kip, Jr., New Castle, N.Y., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 21, 1991, Ser. No. 796,564
Int. Cl.[5] B65H *57/12, 57/18, 49/08*
U.S. Cl. 242—157 R 13 Claims



1. A payout tube for a cable disposed in a coil in a container having an outlet hole for such tube in a wall of said container, said tube comprising: a tubular sleeve having an axis and having an axial passage therein with rear and front openings at entrance and exit ends of said sleeve for said cable, said sleeve being adapted in use to be mostly in said container but to have a portion at the exit end extend out through and beyond said hole, flange means radially projecting at said exit end away from the periphery of said sleeve, and a plurality of struts coupled to, and angularly spaced around, said sleeve and extending from rearward of said flange means axially forward to free ends of said struts disposed near to and in axially spaced relation from said flange means, said struts being radially movable between inner positions at which they are passable

through said hole and outer positions at which said flange means and struts are adapted respectively to bear against opposite sides of portions of said wall adjacent to said hole so as to couple said tube and container.

5,150,853

CRANK-HANDLE FOR A FISHING REEL

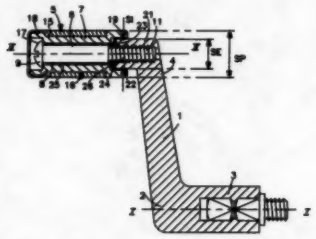
Jean Bernard, 134 avenue des Lacs, 74300 Scionzier, and Jean Ruin, En Bud Thyez, 74300 Cluses, both of France

Filed Oct. 3, 1989, Ser. No. 416,518

Claims priority, application France, Oct. 7, 1988, 88 13453

Int. Cl.[5] A01K *89/00*

U.S. Cl. 242—283 **4 Claims**



1. A crank arm for coupling a handle to a main rotational shaft of a fishing reel comprising:

an arm coupling means on one side of a first end of said arm for attaching said arm to said main rotational shaft of the fishing reel;

a projection at the other end of said arm and on a side thereof opposite to said one side;

a handle;

an end bore in said handle, having a side wall and a planar bottom; and

a shoulder formed within said end bore and in a plane on said projection; and

means for mounting said handle on said projection for rotation about an axis perpendicular to said plane for limiting the movement of said handle along said axis perpendicular to said plane toward said arm, said mounting means including resilient means for urging said handle away from said arm.

5,150,854

TWO-BEARING REEL PROVIDED WITH ENGAGING MEMBERS FOR SUSPENDER STRAP

Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Co., Ltd., Osaka, Japan

Filed May 29, 1990, Ser. No. 529,579

Claims priority, application Japan, May 29, 1989, 1-62871[U]

Int. Cl.[5] A01K *89/033*

U.S. Cl. 242—310 **5 Claims**

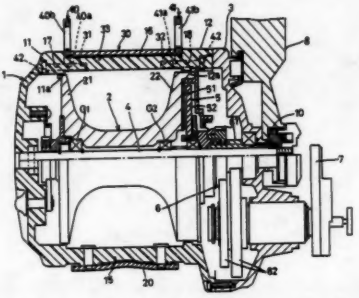
1. A two-bearing reel comprising:

a reel body (1) formed of a synthetic resin, said reel body (1) including a pair of cylindrical side frames (11, 12) opposed to and spaced from each other, and connecting rods (13, 14, 15, 16) rigidly interconnecting at least upper and lower positions of said side frames (11, 12), said connecting rods comprising an upper connecting rod (16) for rigidly interconnecting said upper positions of said side frames (11, 12), wherein said upper connecting rod (16) has opposite ends, wherein all of said connecting rods (13, 14, 15, 16) are formed of said synthetic resin, and wherein said side frames (11, 12) and said connecting rods (13, 14, 15, 16) are all integrally formed with each other,

a spool (2) rotatably supported between said side frames (11, 12) and including a pair of flanges (11*a*, 12*a*) opposed to and slightly spaced from inside walls of said side frames (11, 12),

a pair of engaging members (40, 41) for engaging a suspender strap, said engaging members (40, 41) being arranged at upper positions of said reel body (1) and spaced from each other in a direction in which said side frames (11, 12) are spaced from each other, and

a bridging member (30) formed of a highly rigid material for covering said upper connecting rod (16), for interconnecting the upper positions of said side frames (11, 12) and for reinforcing said engaging members (40, 41) and side



frames (11, 12), said bridging member (30) and upper connecting rod (16) being separate elements of said two-bearing reel, wherein said upper connecting rod (16) has opposite lateral surfaces which extend between said side frames (11, 12), wherein said opposite lateral surfaces have sharp edges, and wherein said bridging member (30) covers said sharp edges of said opposite lateral surfaces of said upper connecting rod (16).

5,150,855

PROPELLER BLADE POSITION CONTROLLER

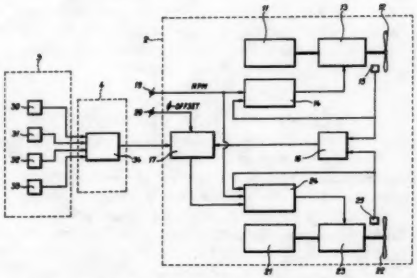
Dick Kaptein, Alphen A/D Rijn, Netherlands, assignor to Fokker Aircraft B.C., Schiphol, Netherlands

Filed Oct. 19, 1990, Ser. No. 600,445

Claims priority, application United Kingdom, Oct. 20, 1989, 8923643

Int. Cl.[5] B64D *31/12*

U.S. Cl. 244—1 N **5 Claims**



1. A method of reducing vibrations in the cabin of an aircraft driven by a plurality of propellers each having n blades, n being a plural integer, wherein said propellers have a relative phase angle which can be adjusted, the method comprising the steps of:

a) measuring the vibration level at one or more positions within the cabin and generating a vibration level signal corresponding thereto;

b) evaluating an error signal in response to said vibration level signal;

c) optimizing the relative phase angle of the propellers in

response to said error signal to a first value at which said measured vibration level is reduced;

d) shifting said propellers relatively through $2\pi/n$ radians to a new relative phase angle where said propellers are substantially in phase and have new relative blade positions;

e) optimizing said new relative phase angle in response to a corresponding vibration level error signal to a second value at which said measured vibration level is reduced; and

f) selecting between said first and second values for improved vibration reduction in the cabin.

5,150,856

SYSTEM FOR ALIGNING THE INERTIAL UNIT OF A CARRIED VEHICLE ON THAT OF A CARRIER VEHICLE

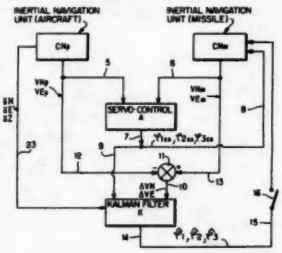
Pierre Gaide, Paris, France, assignor to Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Oct. 29, 1991, Ser. No. 783,903

Claims priority, application France, Oct. 29, 1990, 90 13386

Int. Cl.[5] F41G *7/36*

U.S. Cl. 244—3.2 **7 Claims**



1. A system comprising:

a first moving vehicle provided with a first inertial navigation unit in operation and referenced on a first intrinsic reference axis system tied to a system of terrestrial axes;

a second vehicle provided with a second inertial navigation unit that is to be put into operation, said unit being referenced to a second intrinsic reference axis system similar to said first intrinsic reference axis system, said second vehicle being carried by said first vehicle and being stationary on average relative to said first vehicle;

a closed loop servo-control circuit enabling said second inertial navigation unit to be provided at the instant it is put into operation with angle data delivered by said first inertial navigation unit relative to said first system of reference axes, said servo-control circuit then delivering rotation commands that are applied to said second inertial navigation unit for the purpose of refining its angular initialization;

subtracter means receiving velocity or acceleration data from said first and second inertial navigation units each of which units delivers said data parallel to two non-vertical axes in the corresponding ones of said first and second calculation reference axis systems, said subtracter means delivering velocity or acceleration difference data parallel to the two corresponding non-vertical axes of said first calculation reference axis system; and

a Kalman filter simultaneously receiving said rotation commands from said servo-control circuit and said velocity or acceleration difference data, and calculating estimates of the angle offsets of the axes of said second calculation reference system as corrected by the preceding servo-control relative to the corresponding axes of said first calculation reference axis system, said Kalman filter applying said estimates to said second inertial navigation unit after the servo-control performed by said servo-control circuit has finished and after the Kalman filter has itself converged.

5,150,857

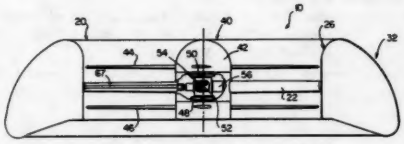
SHROUD GEOMETRY FOR UNMANNED AERIAL VEHICLES

Robert C. Moffitt, Seymour, and Stephen J. Owen, Cheshire, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 13, 1991, Ser. No. 744,560

Int. Cl.[5] B64C *39/06*

U.S. Cl. 244—12.2 **7 Claims**



1. An unmanned aerial vehicle, comprising:

a toroidal fuselage having a coaxial fuselage axis, said toroidal fuselage defining an inner duct flow channel; and

rotor assembly means for providing collective and cyclic pitch to control flight operations of said unmanned aerial vehicle, said rotor assembly means including a pair of multi-bladed, counter-rotating rotors coaxially mounted in said inner duct flow channel to provide high hover efficiency, said multi-bladed, counter-rotating rotors having an axis of rotation coaxial with said fuselage axis;

said toroidal fuselage having an outer aerodynamic surface optimized to retain said high hover efficiency provided by said pair of multi-bladed, counter-rotating rotors coaxially mounted in said inner duct flow channel, to produce a pressure distribution that provides high lift forces in translational flight, to counteract the undesirable nose-up pitching moment produced by lift generated by said rotor assembly means by reducing lift required from said rotor assembly means in translational flight, and to reduce the need for superimposed cyclic pitch for trimmed translational flight;

said outer aerodynamic surface including a leading edge and a trailing edge defined by the lower edge of said inner duct flow channel wherein said trailing edge lies in a plane above the plane of said leading edge.

5,150,858

JETTISONABLE AERODYNAMIC CONTROL SURFACES

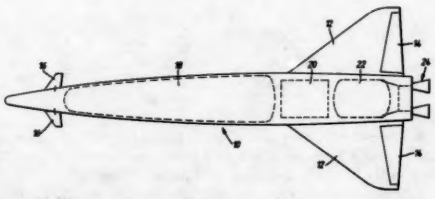
Brian L. Hopwell; Nicholas C. Dale, both of Preston, and Bryan R. A. Burns, deceased, late of Treales, all of United Kingdom by Jean H. Burns, administrator , assignors to British Aerospace Public Limited Company, London, England

Filed Mar. 12, 1990, Ser. No. 491,934

Claims priority, application United Kingdom, Mar. 11, 1989, 8905631

Int. Cl.[5] B64C *39/12*

U.S. Cl. 244—45 A **8 Claims**



1. A flight vehicle including:

main wing means,

aerodynamic control surface means movably connected to said wing means for effecting control in at least the pitch sense of the vehicle,

foreplane means for providing the vehicle with a lift component, and

jettisoning means for jettisoning said foreplanes so as to cancel the lift component provided by said foreplane means.

5,150,859

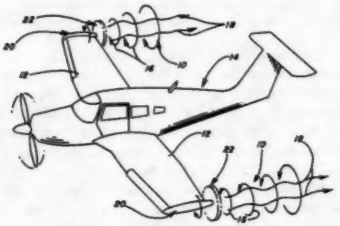
WINGTIP TURBINE

Thomas F. Ransick, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 944,960, Dec. 22, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 257,185

Int. Cl.[5] B64D *41/00*

U.S. Cl. 244—58 **12 Claims**



1. An apparatus for generating power from a trailing vortex induced at the wingtip of an aircraft, comprising:

turbine means mounted on the wingtip, said turbine means including a housing and propeller means disposed in the trailing vortex for extracting a portion of substantially only the rotational energy of the trailing vortex, said propeller means comprising a plurality of propeller blades adjustably oriented to remain generally parallel to the axial component of the vorted velocity of the vortex to utilize substantially only the radial component of the vorted velocity of the vortex to thereby reduce the vortex strength and decrease wing drag; and

means for coupling the wingtip turbine means to a wing de-icing system, and including compressor means located within the housing of the turbine means and coupled to the propeller means disposed in the trailing vortex for operating the wing de-icing system.

5,150,860

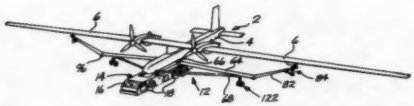
AIR VEHICLE LAUNCHING DEVICE

Manley A. Young, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 23, 1991, Ser. No. 690,063

Int. Cl.[5] B64F *1/10*

U.S. Cl. 244—63 **26 Claims**



1. A device for supporting, for taxi and take-off, an air vehicle having a fuselage and a pair of wings extending laterally outwardly from the fuselage, said device comprising:

a center carrier having at least one support for the fuselage and a member that engages a take-off surface and reacts centerline vertical loads to said surface;

a pair of outrigger assemblies spaced laterally from said carrier on opposite sides of said carrier; each said assembly including a wing support and a portion that engages said take-off surface to independently react wing weight vertical loads to said surface; and

a pair of connector structures connecting said assemblies, respectively, to said carrier; said connector structures allowing vertical movement of said outrigger assemblies relative to said carrier, wherein each connector structure includes a main boom, having a laterally inner end connected to said carrier and a laterally outer end and an outer boom pivotally attached to said outer end, to pivot about a horizontal axis between a support position and a release position,

wherein said engaging portion of said outrigger assembly extends downwardly from said main boom, and said wing support is carried by said outer boom.

5,150,861

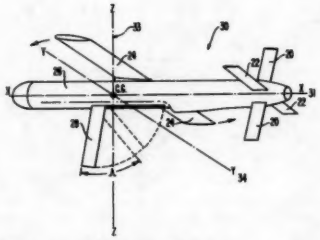
VARIABLE SWEEP SIDE FORCE GENERATOR AND ROLL CONTROL DEVICE

Edwin W. Merkel, Valley Center, and Stephen W. Koontz, Wichita, both of Kans., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 471,139, Jan. 26, 1990, abandoned. This application Oct. 4, 1991, Ser. No. 770,729

Int. Cl.[5] B64C *5/12*

U.S. Cl. 244—91 **15 Claims**



1. An airborne vehicle comprising:

a main body having a roll axis, a yaw axis, and a pitch axis;

means, connected to said main body, for providing lift;

means, connected to said main body, for effecting yaw attitude control about said yaw axis to induce sideslip;

means, pivotably connected to said main body, for effecting roll attitude control about said roll axis to counteract said sideslip, said roll attitude control means comprising at least an airfoil variably positionable between a retracted position and a plurality of extended positions in a geometric plane defined by said yaw and roll axes; and

means responsive to a normal load factor for automatically positioning said airfoil in a position selected to produce a roll effect to counteract undesired roll effects inherent with sideslip.

5,150,862

IN-FLIGHT REVERSER

Jefre H. Cockerham, Lake Worth, and Edward B. Thayer, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 11, 1991, Ser. No. 640,333

Int. Cl.[5] B64C *15/02*

U.S. Cl. 244—110 B **8 Claims**

1. An in-flight reverser for gas turbine engine aircraft comprising:

a fuselage having a longitudinal fuselage axis from forward to rearward;

a gas turbine engine exhaust duct within said fuselage;

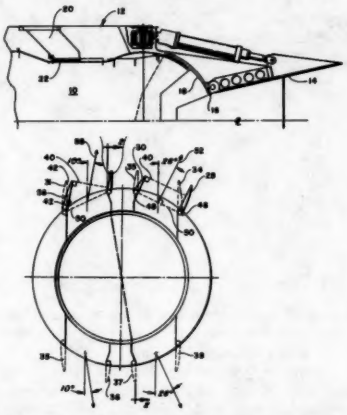
a closeable throat exhaust nozzle connected to receive gas from said gas turbine engine exhaust duct and to discharge the gas rearwardly;

a plurality of reverser flow passages from said exhaust duct

through said fuselage, arranged to direct gas flow with a forward component with respect to the fuselage;

a reverser exhaust valve for selectively fluidly connecting said exhaust duct to said reverser flow passages;

a door set at the outlet of each reverser flow passage with no intervening space between said door set and said reverser flow passage;



each door set comprising a pair of vanes pivotally secured to said fuselage along a pivot axis parallel to said fuselage axis; and

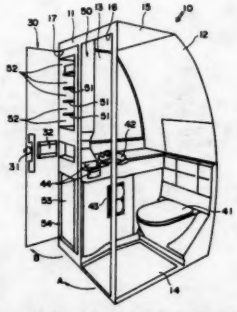
means for controlling said doors to various positions around said pivot axis of each door, keeping each pair of doors parallel to each other, and maintaining the total effective flow area of all of said ports constant.

5,150,863

LAVATORY UNIT FOR A PASSENGER AIRPLANE

Hiroyuki Hozumi, Mitaka, Japan, assignor to Jamco Corporation, Tokyo, Japan

Filed Jul. 17, 1991, Ser. No. 731,238
Claims priority, application Japan, Aug. 22, 1990, 2-220409
Int. Cl.[5] B64D *11/00*
U.S. Cl. 244—118.5 **8 Claims**



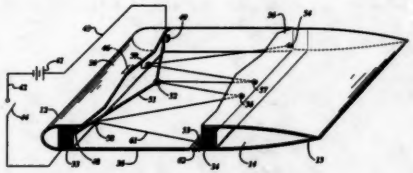
1. A lavatory unit for a passenger airplane having a front wall facing into a passenger compartment, said front wall being provided with an amenities opening for supply and removal of amenities from the passenger compartment, said amenities opening having a flexible amenities door hingedly mounted to said front wall along one edge of said amenities door adjacent one side of said amenities opening, a rigid rod secured to a middle portion of said amenities door adjacent to an edge thereof opposite to the hinged edge of said amenities door in a manner producing a lengthwise curvature of said door convexly in the direction of the passenger compartment along an unhinged edge of said amenities door, a door latch mounted on said amenities door and having an element thereof cooperating with a portion of the front wall adjacent said latch for securing and releasing said amenities door, whereby pressure exerted on said amenities door adjacent said latch depresses the convexly curved edge of said amenities door enabling said amenities door to be secured by means of the single latch.

5,150,864

VARIABLE CAMBER CONTROL OF AIRFOIL

Robert L. Roglin, Duluth, and Sathyanaraya Hanagud, Atlanta, both of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Sep. 20, 1991, Ser. No. 763,163
Int. Cl.[5] B64L *3/44*
U.S. Cl. 244—219 **17 Claims**



1. An apparatus for altering the curvature of a curved surface of a member wherein the member has first and second laterally extending substantially parallel spaced walls and spaced side portions, said apparatus comprising:

an elongated means of a shape memory alloy having first and second ends, said first end being connected to the first wall of the member at one side thereof, and said second end being connected to the first wall of the member at a second side thereof,

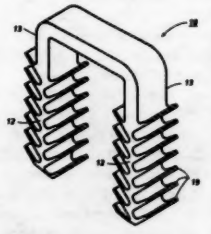
tension means connected to the second wall of the member, said tension means including means for engaging said elongated means, and actuating means for causing at least a portion of said second wall to be moved relative to said first wall, said actuating means comprising means for causing said elongated means to revert to its remembered shape to apply tension to said tension means to alter the curvature of the curved surface of the member.

5,150,865

UNIVERSAL FASTENER

Gregory P. Miller, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 18, 1989, Ser. No. 451,662
Int. Cl.[5] F16L *3/08*
U.S. Cl. 248—71 **25 Claims**



1. A substantially U-shaped one piece universal fastener for

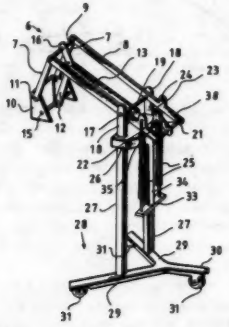
cooperative association with a pair of leg receptor slots in a substrate to fasten an elongated body therebetween, said fastener comprising two separated substantially parallel elongated flexible leg members joined at one end by a tying member, each of said elongated leg members having an interior and an exterior side, and on each of said interior and exterior sides, a plurality of flanged flexible stop members vertically inclined toward said tying member and forming an angle of from about 40° to about 50° with the axis of said leg member.

5,150,866

SUPPORT FOR A HOSE FOR FILLING LIQUID INTO A CONTAINER

Ladislav S. Karpisek, 86 Woodfield Boulevarde, Caringbah, New South Wales, Australia 2229

Filed May 9, 1991, Ser. No. 697,713
Claims priority, application Australia, May 14, 1990, PK0125
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—79 **5 Claims**



1. A hose support, comprising:

an arm having two arm parts and two ends with each of said arm parts being a parallel link arrangement and said two parallel link arrangements having a shared link so that said two arm parts are interconnected, said two ends of said arm being links of said parallel link arrangements which are both parallel to said shared link;

a hose mount fixed to one of said ends of said arm;

a base assembly fixed to one of said ends of said arm, other than said end affixed to said hose mount, with said parallel link arrangements lying in a common plane and said hose mount being able to travel in a straight line path in the common plane between a first limit of travel and a second limit of travel as said hose mount is being moved relative to said base assembly, said base assembly having a connection point thereon;

an arm extension projected beyond said end of said arm which is affixed to said base assembly with a connection point on said arm extension;

tensioned resilient means for connecting said connection point of said base assembly and said connection point of said arm extension for pivotally moving said arm relative to said base assembly and for biassing said hose mount towards its second limit of travel; and,

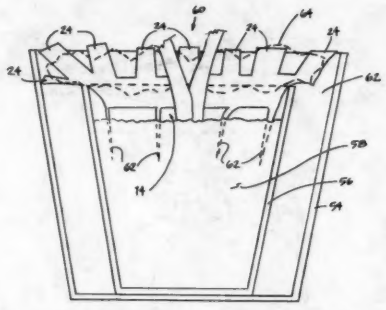
prop means having a first end connected to said base assembly and a second end connected to said arm extension releasably for maintaining said hose mount at its first limit of travel.

5,150,867

SUPPORT MEMBER

Joel J. Pesapane, 3954 W. Pine, St. Louis, Mo. 63108

Filed Apr. 6, 1990, Ser. No. 505,915
Int. Cl.[5] A01G *9/02*
U.S. Cl. 248—213.2 **22 Claims**



1. A support member for use in association with a plant container containing a plant, the support member for supporting decorative dressings, comprising:

collar means for generally enclosing a plant within a container, the collar means having opposing end portions, the collar means formed of a generally pliant material and in use contorted to bring the opposing end portions into a generally proximate relationship and during storage is generally planar;

extensions from the collar means adapted for insertion into an amount of soil contained in a soil receiving portion of the container; and

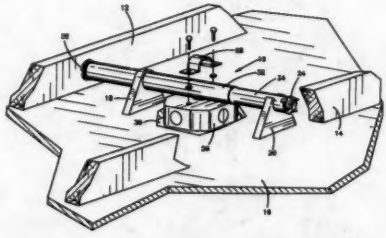
projections from the collar means adaptable for supporting a quantity of a dressing material and maintaining the dressing material substantially separate from the plant and associated containers.

5,150,868

EXTENSIBLE INTERJOIST HANGER SUPPORT ASSEMBLY

Milton E. Kaden, 446 Audrey Dr., Richmond Heights, Ohio 44143

Filed Apr. 23, 1991, Ser. No. 690,811
Int. Cl.[5] H02G *3/08*
U.S. Cl. 248—343 **10 Claims**



1. An extensible interjoist hanger support assembly for spanning between a pair of spaced-apart joists having opposing surfaces, comprising:

first and second telescopically extensible members movable in opposing axial directions between a fully collapsed length and a fully extended length, said members having cooperative means normally in threaded engagement with one another such that rotation of either of said members

relative to the other results in axial movement between said fully collapsed length and said fully extended length;

each said member having a free end carrying joist-engaging means for engaging one of said opposing surfaces of a pair of said joists; and

said cooperative means including quick release means for releasing said members from said threaded engagement while permitting quick slidable axial movement of said members relative to each other in response to axially applied forces in opposing directions to cause said members to move toward said fully extended length while permitting only rotational threaded movement to achieve movement in the opposite axial direction toward said collapsed length.

5,150,869

MULTI-FUNCTIONAL COASTER

Murray J. Gould, Gaithersburg; Joshua L. Kohn, Owings Mills, and Matthew O. Kohn, Baltimore, all of Md., assignors to Longacre & White, Arlington, Va.

Filed Nov. 5, 1990, Ser. No. 608,743

Int. Cl.[5] A47G *19/22*

U.S. Cl. 248—346.1 **6 Claims**

1. A coaster for supporting a receptacle, said coaster comprising:

a platform having a periphery and a surface for supporting the base of said receptacle, said platform defining an axial direction substantially perpendicular to said surface and a radial direction substantially perpendicular to said axial direction;

a flange projecting generally radially outwardly from said periphery; and

a skirt projecting generally axially from said periphery, said skirt including a radially outwardly projecting portion along at least part of its length and spaced from said platform, said radially outwardly projecting portion of said skirt is formed on a segment of said skirt by a radially outwardly projecting portion of an insert fast with said skirt,

wherein said flange and said radially outwardly projecting portion of said skirt are together engagable with a cap on a vessel and said cap is removable from said vessel by leverage of said coaster when said flange and said radially outwardly projecting portion are in engagement with said cap.

5,150,870

VEHICLE SEAT

Hiroshi Matsuura, Washizu, Japan, assignor to Fujikiko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1990, Ser. No. 588,802

Claims priority, application Japan, Sep. 30, 1989, 1-115177[U]

Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—421 **1 Claim**

1. A vehicle seat comprising:

a seat cushion frame for mounting a seat cushion having a front and a rear portion,

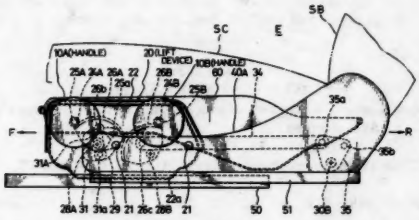
a pair of seat base plates arranged parallel to and spaced from each other,

front and rear seat lift handles,

front and rear seat lifting devices actuated by said front and rear seat lift handles, respectively, for adjustably lifting said front and rear portions, respectively, of the seat cushion, and

first and second spaced mounting frames removably affixed to an inside surface of one of said seat base plates for pivotably supporting said front and rear seat lift handles,

a front shaft rotatably supported between said pair of base plates under the front portion of said seat cushion frame,



means for rotating said front shaft rotatably supported between said first and second mounting frames,

a rear shaft rotatably supported between said pair of base plates under the rear portion of said seat cushion frame, and

means for rotating said rear shaft rotatably supported between said first and second mounting frames,

whereby the pair of mounting frames can be assembled as one unit and removably mounted between a pair of said seat base plates in such a manner that the front and rear seat lift handles are disposed over and about one of said seat base plates.

5,150,871

VEHICLE SEAT

Yoshitaka Negi, and Hiroshi Matsuura, both of Kosai, Japan, assignors to Fujikiko Kabushiki Kaisha, Tokyo, Japan

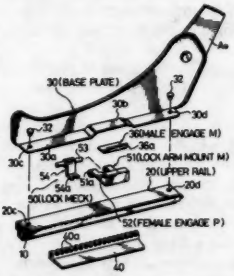
Division of Ser. No. 536,349, Jun. 11, 1990, Pat. No. 5,083,735.

This application Jan. 27, 1992, Ser. No. 826,369

Claims priority, application Japan, Jun. 30, 1989, 1-77320[U]; Jun. 30, 1989, 1-77321[U]

Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—429 **3 Claims**



1. A vehicle seat, comprising:

(a) a pair of lower rails arranged on a vehicle body floor at an interval along a vehicle transversal direction;

(b) a pair of upper rails slidably disposed on said lower rails, respectively;

(c) a pair of base plates fixed to said upper rails, respectively on both ends thereof;

(d) engagement means for removably engaging said base plates and said upper rails at roughly middle portions thereof, respectively to prevent inward deformation of each of said base plates from each of said upper rails when a large load is applied to said base plates, a lock mechanism having a lock arm mounting member fixed to said upper rail at roughly middle thereof to lock the seat at any desired position in cooperation with a seat position locating member, said engagement means comprising:

(e) a female engagement portion formed integral with the lock arm mounting member of the lock mechanism; and

(f) a male engagement member fixed to said base plate at the middle thereof and engageable with said female engagement portion of the lock arm mounting member.

5,150,872

POWER SEAT SLIDE DEVICE

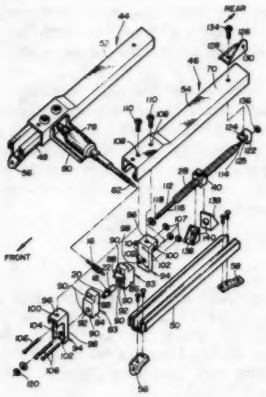
Tohru Isomura, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed May 16, 1991, Ser. No. 700,853

Claims priority, application Japan, May 29, 1990, 2-56053[U]

Int. Cl.[5] B60N *1/08*

U.S. Cl. 248—429 **13 Claims**



1. A power seat slide device comprising:

a stationary rail;

a movable rail axially slidably engaged with said stationary rail, said movable rail and said stationary rail being assembled to define therebetween an elongate tunnel which extends along a common axis of said stationary and movable rails;

a driven threaded shaft housed in said elongate tunnel and having both ends rotatably supported by said movable rail;

a nut received in said elongate tunnel and fixed to said stationary rail, said driven threaded shaft being operatively engaged with said nut so that rotation of said driven threaded shaft about its axis induces a longitudinal movement of said movable rail relative to said stationary rail;

a drive device mounted on said movable rail, said drive device having a drive shaft;

a gear mechanism arranged between said drive shaft and said driven threaded shaft for transmitting a power of said drive shaft to said driven threaded shaft;

a gear housing for housing therein said gear mechanism; and

a pair of holders secured to said movable rail, such that said gear housing is disposed between said holders, said holders having means to tightly clamp said gear housing therebetween and such that said gear housing and said holders are aligned along said driven threaded shaft.

5,150,873

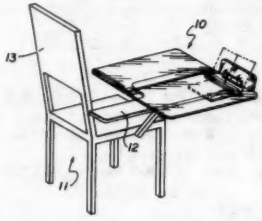
PORTABLE AUXILIARY DESK TOP ARTICLE

James M. Donovan, 7821 Laurel Ave., Cincinnati, Ohio 45243

Filed May 16, 1991, Ser. No. 701,106

Int. Cl.[5] A47B *97/00*

U.S. Cl. 248—460 **19 Claims**



1. A portable auxiliary desk top article for use on a student desk to enlarge a work surface area of the desk, said auxiliary desk top article comprising a first substantially rigid flat surface member and a second substantially rigid flat surface member hingedly attached together so as to be capable of folding together, wherein one flat surface member has a pocket structure attached to an underside, said pocket structure having a bottom wall and two adjacent side walls and further being open-sided on two adjacent sides such that the pocket structure can be slipped over a work surface arm of the student desk and remain there so as to hold the flat surface member in place and further wherein folding out of the second flat surface member forms the enlarged work surface area.

5,150,874

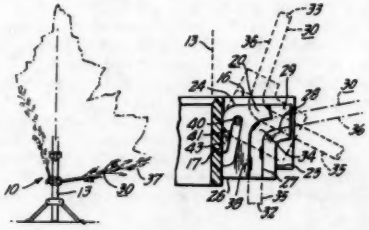
APPARATUS FOR MOUNTING FOLDABLE BRANCHES TO AN ARTIFICIAL TREE

Si Spiegel, Briar Cliff Manor, and Sherman Smith, Newburgh, both of N.Y., assignors to Hudson Valley Tree, Inc., Newburgh, N.Y.

Filed Mar. 26, 1990, Ser. No. 499,614

Int. Cl.[5] A47G *33/00*

U.S. Cl. 248—514 **22 Claims**



1. A bracket assembly for mounting foldable artificial tree branches to an artificial tree trunk comprising:

at least one branch member having an elbow adapted for pivotal engagement with said bracket upon movement of said member between a stowed and an operative position;

a hinge piece for mounting said member to said bracket for pivotal movement between the stowed and operative positions, said hinge piece haivng a bottom surface, and an open-sided groove extending downwardly and terminating proximate to said surface for snap fit reception of said member so as to suspend said member radially from said bracket in said operative position;

snaps along said groove for securing said member in said groove so as to limit movement of said member about said bracket when in the stowed and operative positions; and

means for guiding said hinge piece upon movement of said member between the stowed and operative positions,

said guiding means restricting movement of said member about said bracket when in the stowed and operative positions while assisting in securing said member to said hinge piece.

5,150,875

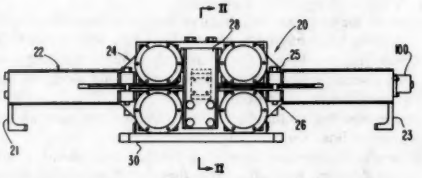
LINEAR MASS ACTUATOR

Sidney E. Holloway, III, Newport News; Edward A. Crossley, Jr., Gloucester Point; Irby W. Jones, Newport News; James B. Miller, Norfolk; C. Calvin Davis, Hampton; Vaughn D. Behun, Hampton, and Lewis R. Goodrich, Sr., Hampton, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 22, 1991, Ser. No. 735,149

Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—550 **20 Claims**



1. A linear mass actuator comprising:

an upper housing and a lower housing connectable to each other and having a central passageway passing axially therethrough;

a mass linearly movable in the central passageway;

roller means, mounted in the upper and lower housings and being in frictional engagement with the mass, for translating the mass linearly in the central passageway; and

drive means, operatively coupled to the roller means, for rotating the roller means and thus driving the mass axially in the central passageway.

5,150,876

SERVO VALVE

Gerald W. Pickard, Bishops Waltham, Southhampton SO3 1RS, England

Filed May 13, 1991, Ser. No. 698,906

Claims priority, application United Kingdom, May 12, 1990, 9010706

Int. Cl.[5] F16K *11/02, 31/16*

U.S. Cl. 251—14 **2 Claims**

1. A servo valve for controlling a flow of fluid in a bore including:

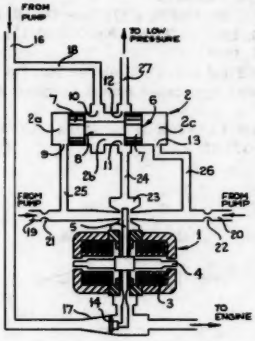
at least one electrical winding;

an armature;

a flapper means securely fixed to the armature; and

a feedback arrangement comprising a radially extending plug attached to the flapper means;

wherein the flapper means has two arms which protrude outwardly from the armature, the ends of which arms are spatially independent from one another and to the end of one of which arms the feedback arrangement is attached such that said plug is located within a tapering portion of said bore, fluid flow in



the bore causing deflection of the plug and the end of the other arm comprises a valve.

5,150,877

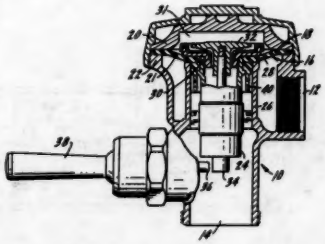
FLUSH VALVE REFILL RING

John F. Whiteside, Franklin Park, and Bradley S. Richardson, Chicago, both of Ill., assignors to Sloan Valve Company, Franklin Park, Ill.

Filed Feb. 11, 1992, Ser. No. 833,749

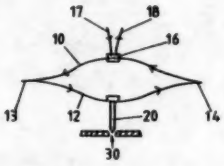
Int. Cl.[5] F16K *31/385, 31/145*

U.S. Cl. 251—40 **6 Claims**



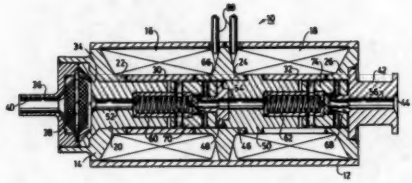
1. In a flush valve, a body having an inlet and an outlet, a passage connecting the inlet and outlet, a valve seat at one end of said passage, a diaphragm positioned to control the flow of water through said passage and to close upon said seat, a guide member attached to the underside of said diaphragm and positioned within said passage, a refill ring attached to said guide member adjacent the diaphragm, said refill ring having an upstream end which is in spaced peripheral contact with said passage when said diaphragm is closed on said valve seat, said refill ring having a plurality of exterior axially extending circumferentially spaced fins in contact with said passage, the spaces between fins providing water flow paths which modulate the flow of water through said passage as said diaphragm closes on said valve seat, each water flow path having a first portion of generally constant flow area adjacent the downstream end of said refill ring, and a second portion which connects the first portion with the upstream end of said refill ring, said second portion gradually decreasing in flow area from said first portion to the upstream end of said refill ring.

5,150,878
LINEAR ACTUATOR
William H. Woodward, 2 Sansome Close Hackleton, Northampton NN1 3QR, England
PCT No. PCT/GB90/00579, § 371 Date Dec. 9, 1991, § 102(e) Date Dec. 9, 1991, PCT Pub. No. WO90/13171, PCT Pub. Date Nov. 1, 1990
PCT Filed Apr. 17, 1990, Ser. No. 778,121
Claims priority, application United Kingdom, Apr. 15, 1989, 8908600
Int. Cl.[5] F16K *31/02*; H02K *41/035*
U.S. Cl. 251—129.01 **8 Claims**



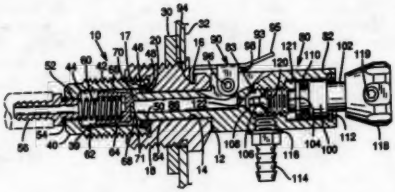
1. A linear actuator which comprise two elongate resilient elements joined together at their opposite ends, a first one of the elements being fixed at a point intermediate its ends and the two elements being arranged to carry an electric current, and means for providing a magnetic field transverse to the two elements so that when the electric current is passed through them, the two elements move apart.

5,150,879
THRUSTER VALVE
Michael J. Mullally, Clifton Springs, N.Y., assignor to Valve Tech, Inc., Phelps, N.Y.
Filed May 8, 1991, Ser. No. 697,647
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.21 **26 Claims**



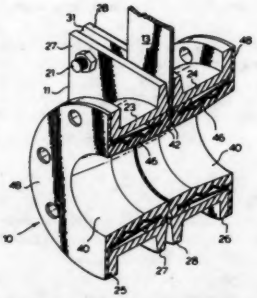
1. A solenoid valve for use in an environment that subjects the valve to shock comprising:
a core having a central bore formed therein;
a first plug mounted at one end of said central bore and having a first conduit formed therein interconnecting said central bore with a first port;
a second plug mounted at the other end of said central bore having a second conduit formed therein interconnecting said central bore with a second port;
a passage defined within said central bore interconnecting said first and second conduits;
a first guide member projecting from said first plug into said central bore;
a second guide member projecting from said second plug into said central bore;
a plunger having a guide bore formed therein supported on said first and second guide members for guiding movement of said plunger along said central bore between said first and second plugs;
a valve seal carried within said guide bore between said first and second guide members for opening and closing said passage interconnecting the first and second conduits; and
a valve seat forming one end of said second guide member within said guide bore and encompassing at one end of said second conduit an opening that is opened and closed by said valve seal.

5,150,880
VALVE ASSEMBLY WITH FLOW CONTROL
George K. Austin, Jr., 12755 NE. Parrett Mountain Rd., Newberg, Oreg. 97132, and Sandor Johannes, 2189 Hidden Springs Ct., West Linn, Oreg. 97068
Filed Feb. 14, 1991, Ser. No. 656,408
Int. Cl.[5] F16L *29/02*
U.S. Cl. 251—149.3 **3 Claims**



1. A valve assembly comprising:
a female member connectable to a fluid source and having an internal bore having a longitudinal axis and located for receiving fluid from the source, the female member having a straight slot formed therein to extend along an axis perpendicular to the bore axis;
a male member including a body, an elongated nose and an internal bore for carrying fluid:
a flow-control valve mounted to the male member and operable for regulating the flow of fluid through the internal bore, the male member being connectable to the female member so that fluid in the bore of the female member may flow through the bore of the male member;
a latch carried on the male member and shaped to engage the straight slot on the female member when the male and female members are connected, the slot retaining the latch in a manner that prevents rotation of the connected male member relative to the female member.

5,150,881
GATE VALVE SLEEVE
Thomas P. McKavanagh, 95 Temperance Street, Aurora, Ontario, Canada L4G 2R1
Filed Nov. 18, 1991, Ser. No. 793,526
Int. Cl.[5] F16K *3/02, 3/312, 25/00*
U.S. Cl. 251—174 **17 Claims**



1. A sealing arrangement for a gate valve comprising at least

one cylindrical-like seal, each cylindrical like seal having a body made of a resilient material and a cooperating buckling means, said at least one seal having a sealing end engaging a gate of the gate valve, an anchoring end securing said at least one seal in the gate valve, and an intermediate section joining said sealing end and said anchoring end and accommodating controlled buckling of said buckling means and said intermediate section as said sealing end is forced toward said anchoring end during movement of said gate in a closing direction; said intermediate section having a recess formed therein with said buckling means disposed within said recess, said controlled buckling being predetermined by the configuration of said buckling means to buckle in a radial direction of said seal distorting said recess as said sealing end moves towards said anchoring end, said buckling means transferring forces between said sealing end and said anchoring end and creating a bias during controlled buckling of said intermediate section urging said intermediate section to return to the wall configuration prior to controlled buckling of said intermediate section when said gate is moved in an opening direction.

5,150,882

TREATMENT SYSTEM HAVING GATE DEVICE FOR DECOMPRESSION CHAMBER

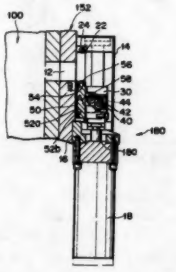
Satoshi Kaneko, Yokohama, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Jul. 17, 1991, Ser. No. 731,474

Claims priority, application Japan, Jul. 20, 1990, 2-192472

Int. Cl.[5] F16K *25/00*

U.S. Cl. 251—193 **11 Claims**



1. A treatment system having a gate device for a decompression chamber to be used for opening and closing a gate aperture through which an object to be treated is loaded and unloaded, comprising:

wall means for defining the gate aperture arranged on it;

a gate for being pressed against said wall means to hermetically cover the gate aperture;

a support member for supporting said gate, said support member being movable toward and away from said gate aperture in a first direction;

means for driving said support member in a second direction substantially perpendicular to said first direction;

a stopper plate arranged at an end of said gate in said second direction and having a surface inclined divergently from an edge remote from the gate aperture toward an edge close to the gate aperture, said stopper plate being made of a material selected from sapphire, ruby and an iron or nickel-based double boride hard alloy;

a roller arranged to abut said stopper plate, the axis of said roller being stationary relative to said wall means; and

converting means for converting part of a force applied to said roller by said gate through said stopper plate in said second direction into a force moving and urging said gate toward said wall means in said first direction.

5,150,883

FLUID MECHANICS DEVICES

David M. Cook-Martin, Rawtenstall, England, assignor to Unilab Holdings, Ltd., Lancashire, England

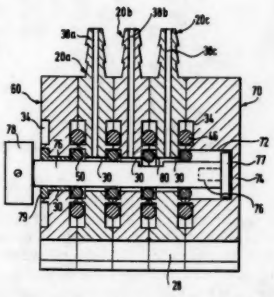
PCT No. PCT/GB89/00757, § 371 Date Dec. 31, 1990, § 102(e) Date Dec. 31, 1990, PCT Pub. No. WO90/00695, PCT Pub. Date Jan. 25, 1990

PCT Filed Jul. 5, 1989, Ser. No. 634,124

Claims priority, application United Kingdom, Jul. 5, 1988, 8815923

Int. Cl.[5] F16K *31/00*

U.S. Cl. 251—367 **9 Claims**



1. A fluid mechanics device comprising a plurality of wafer components assembled into a block, in which at least a first one of the wafer components has an axial port extending through it from one face to the opposite face; a radial port communicating with the axial port and extending to one edge of the wafer; and at least one resilient ring seal forming a static seal between the first wafer component and a mating face of another of the wafer components in the block, characterized in that there are two concentric annular recesses in each face of the wafer, each inner recess being open on its inside into the axial port, the two outer annular recesses being of the same dimensions and providing alternative locations for the static ring seal, and the two inner annular recesses being of the same dimensions and providing alternative locations for a further resilient ring seal operative between the wafer and an axially movable actuator movable relatively to the axial port.

5,150,884

CARPET STRETCHER ATTACHMENT UTILIZING PIVOTALLY MOUNTED PULLING PLATE

Raymond E. Hyer, 2194 Saragossa Ave., DeLand, Fla. 32725, and Michael L. Hyer, 835 W. Gaucho Cir., Deltona, Fla. 32724

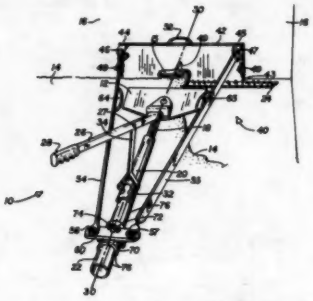
Filed Aug. 3, 1990, Ser. No. 562,612

Int. Cl.[5] B66D *1/00*

U.S. Cl. 254—209 **11 Claims**

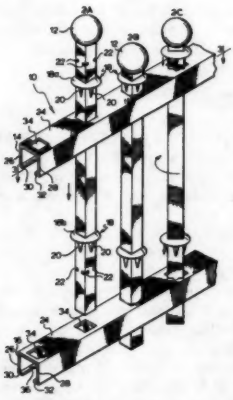
3. A portable carpet stretching device for enabling a user to stretch carpeting at an angle into engagement with a tack strip affixed along the base of an adjacent wall, said device comprising a carpet-engaging head member and a base member, each of said members having front and rear portions, with the front of said base member being attached by an extensible member to the rear of said head member, such that in a use position, said head member is closer to the adjacent wall than said base member, anchoring means for securing said base member with its front portion in a fixed relationship to the adjacent wall, power applying means for causing said head member and said base member to be forced apart, the anchoring of said base member with respect to the adjacent wall by said anchoring means resulting in a portion of the carpet engaged by said head member being forced toward the adjacent wall and into contact with the tack strip when said head member and said base member are forced apart by said power applying means,

said anchoring means comprising a pulling plate having elongate upper and lower edges, with the lower edge of said pulling plate including means for engaging the tack strip located along the base of the adjacent wall, a pair of elongate arms connecting the upper edge of said pulling plate to said base member, with one end of each of said arms being pivotally



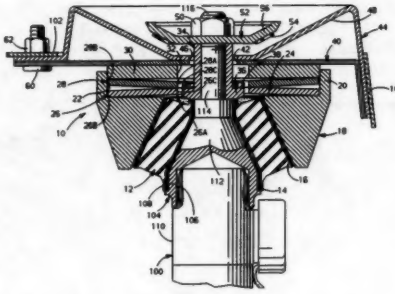
connected adjacent one upper corner of said pulling plate and the other end of each arm being pivotally connected to the rear portion of said base member, this pivotal connection of said arms enabling said head member to be moved into a non-symmetrical relationship to said pulling plate, whereby a pull at an angle to the adjacent wall can be applied to the carpet by said head member when said power applying means is utilized.

5,150,885
PICKET FENCE ASSEMBLY
Nicola Leone, 5652 - 8th Line, R.R. #2, Hornby, Ontario, Canada L0P 1E0
Filed Apr. 18, 1991, Ser. No. 687,347
Int. Cl.[5] E04H *17/16*
U.S. Cl. 256—22 **3 Claims**



1. A picket fence assembly comprising in combination: C-shaped upper and lower rails each having lower, spaced-apart, opposed flanges and a plurality of non-circular apertures therethrough in substantial vertical alignment; a plurality of vertically disposed pickets, each extending through one of said apertures in said upper rail and through one of said aligned apertures in said lower rail; said pickets having at least one pair of opposite corners and having thereon upper and lower indentations for engaging the upper and lower rails; said pickets being respectively in said apertures wherein said pickets are axially movable in said apertures to a locking position at which the indentations in the pickets are engaged by the rails and axial movement of said pickets relative to said rails is prevented; said rails being provided with a frictional locking means, wherein said pickets are engaged in a frictional fit therewith in said locking position wherein rotational movement of said pickets is restrained, said frictional locking means comprising a plurality of paired opposed indentations in said opposed flanges, said indentations conforming with the pair of opposite corners whereby said pair opposite corners frictionally abut with and engage the opposed indentations.

5,150,886
TOP MOUNT ASSEMBLY FOR A SUSPENSION ACTUATOR
James P. Hamberg, Beavercreek; Todd H. Baldini, Dayton; Stanley E. Smith, Dayton; Wendell Collins, Jr., Dayton, and Richard E. Longhouse, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Sep. 3, 1991, Ser. No. 751,925
Int. Cl.[5] F16F *3/10*
U.S. Cl. 267—220 **12 Claims**

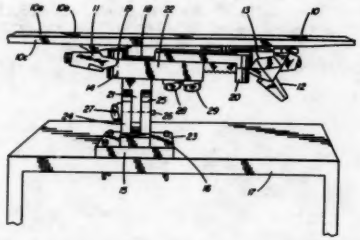


1. A vehicular suspension system comprising:
(A) a hydraulic actuator for supporting a vehicular body; and
(B) a top mount assembly attaching the actuator to the body, the mounting assembly including
(a) a resilient isolator seated on the actuator;
(b) a guiding sleeve seated on the simulator having a recessed cavity;
(c) Belleville spring means received within the cavity;
(d) thrust plate means seated on an uppermost surface of the Belleville spring means;
(e) means for securing the actuator to the thrust plate means; and
(f) means for securing the thrust plate means to the vehicular body.

5,150,887
SKI HOLDING DEVICE
Richard K. Weissenborn, and Gregory A. Komitsch, both of Calgary, Canada, assignors to James B. Anderson, by said Gregory A. Komitsch
Filed Feb. 15, 1991, Ser. No. 656,769
Int. Cl.[5] B23Q *1/04*
U.S. Cl. 269—71 **23 Claims**

15. A ski holding device comprising a ski holding member and a mounting member, said mounting member comprising a base, a mounting bracket, pivot means to permit said ski holding portion to pivot between a position in which a ski engaged by the ski holding member has its base vertical with one side edge uppermost and a position in which the base is vertical with the other side uppermost, clamping means for tightening the pivot and stop means for locking the pivot with the ski in

a horizontal and inverted position, the ski holding member having at one end an open ended slot adapted to engage said pivot means and also to permit downward movement of the ski holding member to engage the stop means when the ski holding member is upright while permitting pivotal movement free of the stop means at other positions of the ski holding portion, and said ski holding member having at its other end means for holding a ski.



5,150,888

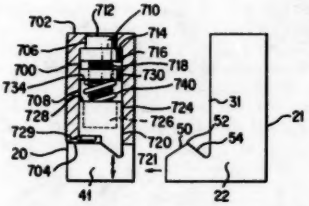
CLAMPING MECHANISM IN A VISE JAW ACCESSORY SYSTEM FOR ATTACHING AND RELEASING VISE ACCESSORIES WHILE MAINTAINING POSITIONAL ACCURACY OF THE ACCESSORIES

David L. Durfee, Meadville, Pa., assignor to Susan M. Durfee, Meadville, Pa.

Continuation-in-part of Ser. No. 636,250, Dec. 31, 1990, Pat. No. 5,065,990, which is a continuation-in-part of Ser. No. 495,777, Mar. 19, 1990, Pat. No. 5,037,075, which is a continuation of Ser. No. 223,428, Jul. 25, 1988, Pat. No. 4,923,186, which is a continuation-in-part of Ser. No. 941,717, Dec. 15, 1986, abandoned. This application Oct. 21, 1991, Ser. No. 780,119

Int. Cl.[5] B25B *1/24, 1/00*

U.S. Cl. 269—254 CS 21 Claims



1. A clamping mechanism in a clamping device for holding an element in a fixed position relative to the clamping device, the clamping mechanism comprising:

a bore extending through the clamping device and opening first and second surfaces of the clamping device, the bore including a first portion having a circular cross-section opening to the first surface and a second portion opening to the second surface;

an actuating screw having a head portion located within the first portion of the bore and a threaded shank extending into the second portion of the bore, the actuating screw being rotatable within the bore;

a plunger located in the second portion of the bore for non-rotatable axial movement within the second portion of the bore, the plunger having a first axial end projecting from the second surface for engaging the element and a second opposite axial end having a recess therein, a perimeter surface being defined on the second axial end by the recess, the plunger including means for retaining the plunger within the bore;

a lock member having an internally threaded aperture threadably engaged with the threaded shank and a contact surface surrounding the aperture, the lock member being located within the second portion of the bore for non-rotatable axial movement within the bore upon rotation of the threaded shank of the actuating screw; and

a spring located about the threaded shank and between the contact face of the lock member and the recess of the plunger, rotation of the actuating screw axially moving the lock member relative to the plunger to vary a biasing force exerted by the spring on the plunger, the contact face of the lock member selectively compressing the spring completely within the recess of the plunger to permit the contact face to contact the perimeter surface of the plunger to prevent axial movement of the plunger within the bore.

5,150,889

SORTER FOR STAPLING

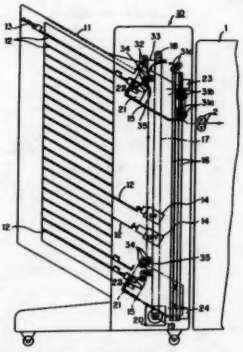
Keiichi Taguchi, Kuse, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 17, 1991, Ser. No. 779,302

Claims priority, application Japan, Oct. 17, 1990, 2-279687; Oct. 17, 1990, 2-279688

Int. Cl.[5] B42B *1/02*

U.S. Cl. 270—53 9 Claims



1. A sorter for stapling comprising:

a plurality of sorting bins arranged to hold copied papers therein;

a paper guide means which discharges the papers to predetermined bins in response to the setting of a sorting process mode and the number of copies to be sorted;

a stapling means which is capable of being moved to the positions that correspond to the predetermined bins, moves to a position that corresponds to a bin in which are held the papers that are to be stapled, and effects the stapling process under the condition where the papers are held in said bin;

a stapling number setting means that sets the number of bins in which are held the papers to be stapled by said stapling means; and

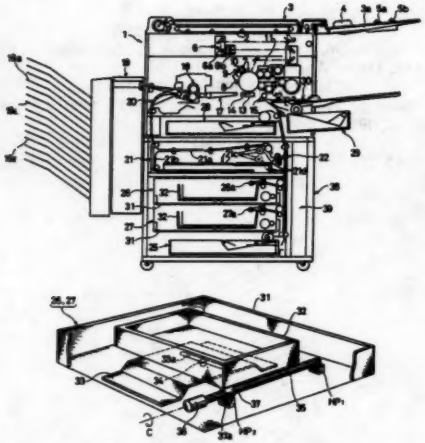
a control means which causes said stapling means to effect the stapling process for only those papers that are held in the bins of a number corresponding to the number of the bins set by said stapling number setting means after the papers have been discharged to said predetermined bins by said paper guide means.

5,150,890

FEEDING DEVICE FOR ENABLING CONTINUOUS COPY PAPER FEED FROM PLURAL COPY PAPER CASSETTES

Norihide Kunikawa, Yao; Yoshikado Yamada, Kashihara; Yoshiteru Mori, Nara, and Toshihisa Matsuo, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 3, 1990, Ser. No. 518,466
Claims priority, application Japan, May 15, 1989, 1-121806
Int. Cl.[5] B65H *3/44*
U.S. Cl. 271—9 25 Claims



1. A feeding device comprising:

at least one copy material orientation changing means which is capable of shifting copy material housed within a corresponding rotatable copy material holding section to at least two feeding positions;

size detection means, provided in connection with said rotatable copy material holding section, for detecting a size of said copy material;

position detection means for detecting a feeding position of said copy material holding section;

a copy material feed unit for holding the copy material which is selected for the current feed;

copy material remaining amount detection means for detecting a remaining amount of copy material in the copy material feed unit selected for the current feed; and

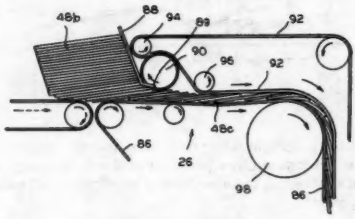
control means for controlling said at least one copy material orientation changing means upon detection of a size and position of copy paper within said corresponding rotatable copy material holding section so as to set said corresponding rotatable copy material holding section in the same feeding position for copy material as the copy material feed unit when copy material of the same size as that placed in the copy material feed unit is placed in said corresponding rotatable copy material holding section and it has been detected by said copy material remaining amount detection means that a remaining amount of the copy material is less than a predetermined amount.

5,150,891

SHINGLE DEVICE FOR USE IN MULTI-PASS SORTING MACHINE

Eduard M. Svyatsky, Libertyville; George Paroubek, Downers Grove, and Frederick P. Hegland, Des Plaines, all of Ill., assignors to Bell & Howell Company, Skokie, Ill.

Division of Ser. No. 501,556, Mar. 29, 1990, Pat. No. 5,119,954.
This application Jul. 26, 1991, Ser. No. 736,427
Int. Cl.[5] B65H *3/04*
U.S. Cl. 271—35 14 Claims



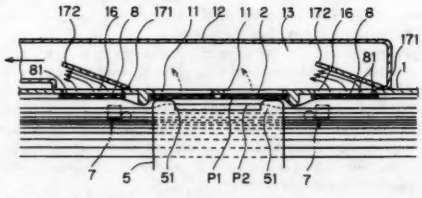
1. A shingler device for documents, suitable for use in a mail sorting apparatus, comprising, in combination, first movable belt means for receiving a vertically stacked array of documents from a document source and conveying said documents along a path defined by a movable reference plane, second movable belt means defining a reach adapted to receive the stack of documents from a terminal end of said first belt means and continue movement of the documents along the path, upstanding guide means for confronting said documents and having a lower end overlying and spaced above said reference plane to define a gap enabling passage of documents from the lower portion of the stack, rotatable roller means having a lower tangential surface adjacent said lower end of said guide means and spaced above said reference plane but below said lower end of said guide means, said roller means being rotatable such that said tangential surface moves in a direction opposite to the direction of movement of documents passing through said gap and causes shingling of documents passing through said gap, and third movable belt means cooperative with said second belt means downstream from said roller means to receive shingled documents from said gap, said third belt means being drivingly interconnected with said roller means so that said third belt means has a longitudinal velocity substantially equal to the tangential velocity of said roller means.

5,150,892

SHEET FEEDING APPARATUS

Tadafumi Shimizu, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 26, 1991, Ser. No. 674,911
Claims priority, application Japan, Mar. 30, 1990, 2-86671
Int. Cl.[5] B65H *3/14*
U.S. Cl. 271—98 16 Claims



1. A sheet feeding apparatus comprising:

sheet supporting means for supporting a stack of sheets to be fed;

vacuum transporting means opposed to at least a leading end of said stack of sheets and adapted to suck a top sheet of said stack to advance it, said vacuum transporting means having a suction section to which a negative pressure is applied; and

means adjacent said vacuum transporting means for contacting at least two portions of said top sheet of said stack, which two portions are located in a region to be sucked by said suction section, so as to retain said two portions at a distance from said suction section so as to corrugate said top sheet;

wherein said vacuum transporting means is opposed to a laterally central portion of said stack of sheets, and auxiliary vacuum transporting means is located adjacent to said vacuum transporting means and opposed to a laterally side end portion of said stack of sheets.

5,150,893

PAPER FEED MECHANISM WITH PLURAL SUPPORT TABLES FOR SUPPLYING CUT SHEETS TO A PRINTING APPARATUS

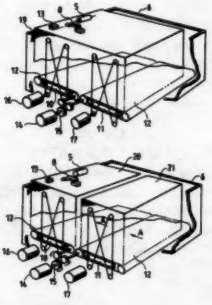
Kazuo Uno, and Junji Shirakawa, both of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1991, Ser. No. 710,480

Claims priority, application Japan, Jun. 8, 1990, 2-151212

Int. Cl.[5] B65H *1/26*

U.S. Cl. 271—157 **5 Claims**



1. A paper feed mechanism for a printing apparatus comprising:

a case;

a plurality of tables provided in said case for supporting at least two sizes of cut sheets thereon, said two sizes of cut sheets including large-sized cut sheets larger than each of said tables and small-sized cut sheets substantially equal to each of said tables;

means for raising and lowering said plurality of tables in synchrony when said tables support said large-sized cut sheets;

means for raising and lowering said plurality of tables separately and independently of each other when said tables support said small-sized cut sheets;

means for moving said small-sized cut sheets from one of said tables to another of said tables when said another of said tables becomes empty of said small-sized cut sheets.

5,150,894

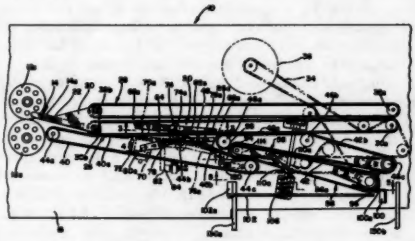
DIVERTER MECHANISM FOR FLAT DOCUMENT CONVEYOR SYSTEM

Mario Ricciardi, Glenview, Ill., assignor to Bell & Howell Company, Skokie, Ill.

Filed Mar. 27, 1991, Ser. No. 676,157

Int. Cl.[5] B65H *39/10*

U.S. Cl. 271—302 **27 Claims**



1. In a conveyor system for conveying generally flat documents on-edge, said system including a primary conveyor belt defining a primary conveyor path, at least one secondary conveyor belt having a first reach disposed in juxtaposed relation to a reach of said primary conveyor belt, means for effecting movement of said primary and secondary conveyor belts to convey a document received on-edge between said juxtaposed belt reaches along said primary path, said secondary conveyor belt having a second reach inclined to said primary conveyor belt so as to establish an open span along said primary conveyor belt immediately downstream from said juxtaposed belt reaches; the combination therewith comprising document diverter means including guide arm means supported adjacent said juxtaposed reaches of said primary and secondary conveyor belts, said guide arm means being selectively movable between a first position operative to guide a non-diverted document along said open span of said primary conveyor belt, and a second position operative to move said juxtaposed belt reaches from said primary conveyor path to divert and guide a document along the inclined reach of said secondary conveyor belt.

5,150,895

METHOD OF AND SYSTEM FOR DETERMINING A POSITION OF BALL RELATIVE TO A PLAYING FIELD, AND BALL PROVIDED THEREFOR

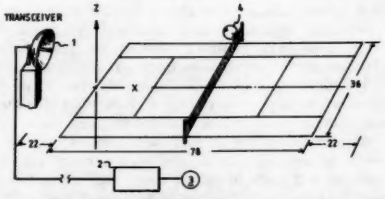
Richard Berger, 30 Cold Spring Hills Rd., Cold Spring Hills, N.Y. 11743

Continuation-in-part of Ser. No. 609,703, Nov. 6, 1990, Pat. No. 5,082,263. This application Sep. 11, 1991, Ser. No. 757,898

The portion of the term of this patent subsequent to Jan. 21, 2009, has been disclaimed.

Int. Cl.[5] A63B *61/00*

U.S. Cl. 273—29 R **4 Claims**



1. A method of determining a position of a ball relative to a playing field, comprising the steps of:

providing a radar sending and receiving device;

arranging a means for reflecting a radar signal against a radar reflective ball;

connecting the radar with a computer which stores various positions located upon said playing field, said positions being designated within a three dimensional spatial relationship defined by X, Y, Z coordinates;

determining the baseline of said playing field as an X coordinate, the sideline as a Y coordinate and the height above the playing field as a Z coordinate;

sending by radar said signal to a moving ball during a game and receiving a signal from said ball by said radar;

comparing said received signal by said computer with the stored position of said playing field so as to determine a position of said ball relative to said playing field;

locating said ball on said defined X, Y Z coordinates;

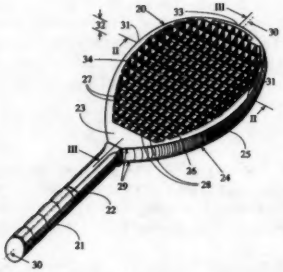
determining, whether said ball is located out of bounds as defined by said X, Y, Z coordinates, emitting a perceivable signal indicating said location, stopping said determination when said location of said ball is determined to be out of bounds as defined by said X, Y, Z coordinates, or, alternatively, redetermining the location of said ball if said ball is determined to be inbounds as defined by said X, Y, Z coordinates until said ball is struck again, and redetermining the position of said ball with respect to the X, Y, Z coordinates with each successive strike of said ball from the previously determined position of said ball on said playing field until said ball is determined to be out of bounds, emitting a second perceivable signal locating said ball and stopping said determination.

5,150,896

GAME RACKET WITH INCURVATE CONTACT SURFACES

David Holmes, 17577 Johnson Ave., Sonoma, Calif. 95476

Filed Mar. 3, 1992, Ser. No. 845,393
Int. Cl.[5] A63B *49/00*
U.S. Cl. 273—67 R **20 Claims**



1. A game racket, comprising: a curvilinear head portion, connected to a handle shaft and grip through an intermediate throat portion; said head portion comprising two incurvate contact surfaces; at least said incurvate contact surfaces and the material elements of said head portion lying between said incurvate contact surfaces being perforated by a plurality of apertures for the passage of air through said head portion; said head portion having a nonuniform thickness with one location of least thickness in the central area of said head portion; each of said incurvate contact surfaces having a continuous, smooth corrective curvature wherein the degree of curvature of either of said incurvate contact surfaces at a given point of contact is defined by the angle of inclination of the tangent plane to said incurvate contact surface through said point of contact with respect to the general plane of said head portion as a whole, and wherein said angle of inclination of each of said tangent planes with respect to said general plane of said head portion is equal and opposite to the average angular displacement of said general plane of said head portion away from an intended plane of contact while said racket is swung by a player striking an incoming ball at said point of contact; said angular displacement being caused by torsional forces exerted differentially on said game racket at each of said points of contact by an incoming ball; and wherein said angular displacement at each of said points of contact and the resultant specific corrective curvature of said incurvate contact surfaces are determined empirically as an average across a random sampling of intended users.

5,150,897

SPORT STRIKING ARTICLES

Alex Wortman, 1705 Wells, Ann Arbor, Mich. 48104

Filed Dec. 4, 1990, Ser. No. 621,794
Int. Cl.[5] A63B *59/06*
U.S. Cl. 273—72 R **3 Claims**

1. A collapsable bat comprising:

an elongated member having a handle end and a hitting end;

a hitting profile defined by a diameter adjacent said hitting end, said hitting profile being that portion of said collapsable bat intended to strike a ball;

as cavity enclosed within said elongated member and adjacent said hitting end;

a plurality of slits disposed on said elongated member, said slits being contiguous with said cavity, said slits enabling said hitting profile to be selectively enlargeable; and

an inflatable bladder residing within said cavity, said bladder having inflation means attached thereto for inflating and deflating said bladder;

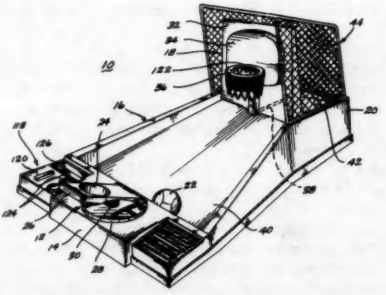
wherein said cavity is enlarged as said bladder is inflated so as to enlarge said hitting profile, said hitting surfaces being displaced radially outward.

5,150,898

GAME APPARATUS

Joel Hochberg, Miami, Fla.; Timothy D. J. Stamper, Ravenstone, and Christopher T. J. Stamper, Twycross Warks, both of England, assignors to Rare Coin-It, Inc., Miami, Fla.

Filed Feb. 11, 1991, Ser. No. 653,253
Int. Cl.[5] A63F *7/20*
U.S. Cl. 273—85 C **17 Claims**



15. A game apparatus for propelling a game projectile towards a target, comprising:

a housing defining a first end portion and a second end portion;

propelling means mounted on the first end portion of the housing for selectively propelling the game projectile towards the target;

translation means for supporting the target adjacent the second end portion of the housing to reciprocate the target along a longitudinal axis towards and away from the propelling means;

power means for powering the translation means to automatically reciprocate the target; and

means for delaying translational movement of the target for a fixed increment of time at a position closest to the propelling means and at a position farthest from the propelling means.

5,150,899

HAND HELD VIDEO GAME WITH SIMULATED RESCUE

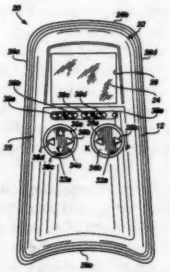
Kazumi Kitaue, Kobeshi, Japan, assignor to Konami Co., Ltd., Kobe, Japan

Filed Jan. 26, 1990, Ser. No. 470,953

The portion of the term of this patent subsequent to Jun. 9, 2009, has been disclaimed.

Int. Cl.[5] A63B *67/00*; A63F *7/06*

U.S. Cl. 273—85 G **1 Claim**



1. A hand-held electronic game comprising:

a plurality of manually operable control pushbutton switches for permitting control of the play of the game by a player;

sound transducer means for generating sound responsive to sound signals;

control circuit means coupled to the control switches and the sound transducer means, and including a processor, a read-only memory, and a random access memory, for generating game control signals and sound signals;

display means having selectively activatable image segments corresponding to a plurality of player-controlled turtle figures, to a plurality of game-controlled figures including throwing star image segments which may be displayed sequentially to simulate attacking motion, a digital counter, and a prisoner image segment enclosed by a capsule image segment and to alpha-numeric game information for selective display thereof, said display means responsive to said control circuit means control signals for display of game images responsive to the game control signals such that only one player-controlled figure is visually displayed at one time at only on of a plurality of pre-determined positions and the position at which the player-controlled figure is displayed is moveable to an adjacent position responsive to activation of a first set of the control switches, some of said plurality of positions corresponding to underwater positions with associated game controlled intermittently activated snare device image segments and some of said plurality of positions corresponding to above-water positions with associated game controlled attacking image segments, said processor comprising means for generating signals to display destruction of the player controlled image while in an underwater position in response to movement through one of the snare devices during an activated period and while in an above-water position in response to simulated collision with an attacking image segment, means responsive to a control switch for enabling the player to destroy an attacking image segment prior to simulated collision, means for controlling display of a punching arm image segment and a sword image segment associated with a displayed player controlled turtle figure, for simulating destruction of mouser image segments responsive to activation by the player of a punching and sword activating control switch pair, means for controlling the display of dynamite image segments to simulate availability of dynamite, and retrieval of dynamite by a player-controlled figure, means for accumulating a score responsive to simulated destruction of mouser image segments and for controlling display of the score, means for setting a predetermined number in response to the player-controlled turtle figure entering an underwater position, for decrementing the counter periodically until the player-controlled turtle figure exits the underwater position and for simulating destruction of a player-controlled turtle figure, and means for controlling the display of the capsule image segment and prisoner image segment to simulate freeing a prisoner.

5,150,900

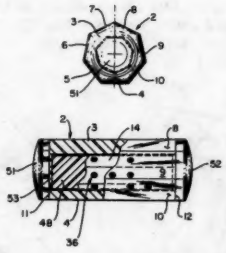
HEPTAHEDRON RANDOM CHARACTER SELECTOR

Joseph J. Onzo, 1561 Fuchsia Dr., San Jose, Calif. 95125

Filed Dec. 18, 1991, Ser. No. 812,139

Int. Cl.[5] A63F *9/04*

U.S. Cl. 273—146 **13 Claims**



1. A random character selector, comprising a heptahedron body portion having an outer heptagonal periphery symmetrical about a central longitudinal axis and including seven facets, and indicia associated with each separate facet and visible on the outer periphery of the heptahedron body portion;

(a) said heptahedron body portion being formed with transparent outer and inner peripheries, and a plurality of sets of different indicia are spaced around the inner periphery of the heptahedron body portion and visible on the outer periphery thereof;

(b) said plurality of sets of different indicia being displayed on a thin flexible sheet, and said sheet is conformed to the inner periphery of said heptahedron body portion whereby said different sets of indicia are visible through the outer periphery of the heptahedron body portion; and

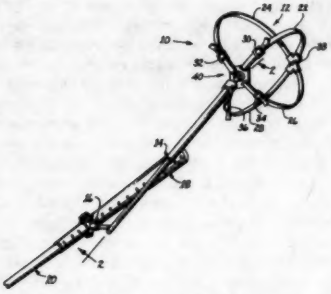
(c) and a core member provided within the conformed flexible sheet to retain the sheet intimately conformed to said inner periphery of the heptahedron body portion.

5,150,901

GOLF SWING TRAINING DEVICE

Raymond J. Stawicki, 1149 N. 92nd Street, #228, Scottsdale, Ariz. 85256

Filed Jan. 27, 1992, Ser. No. 826,474
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186.2 **3 Claims**



1. A golf swing practice device for use in properly guiding the swing of a golfer swinging a golf cub comprising, in combination:

harness means for attaching to the upper portion of a person's body;

an elongated tubular golf club swing guiding member having upper and lower ends;

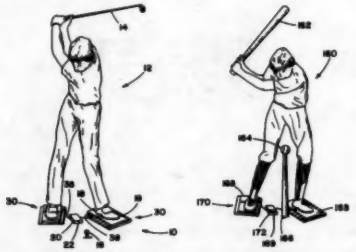
swivel means for swively coupling said upper and lower ends to said harness means and to a handle of a golf club, respectively, for permitting the golfer to achieve a proper swing of the golf club by swinging said golf club without significantly bending the front elbow of the golfer.

5,150,902

GOLFER WEIGHT DISTRIBUTION MEASUREMENT SYSTEM

Doyle J. Heisler, 528 11th Cir., Spearfish, S. Dak. 57783

Filed Jul. 9, 1991, Ser. No. 727,470
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186.1 **22 Claims**



1. An apparatus for measuring a sportsman's weight distribution during a practice swing, comprising:

detection means for sensing the sportsman's weight comprising first and second detection pads, each pad being constructed and arranged to receive one of the sportsman's feet, and for generating weight signals as a function of weight thereon;

reference detection means for sensing an event occurrence corresponding to a point in said practice swing and generating a reference signal corresponding to said event occurrence; and

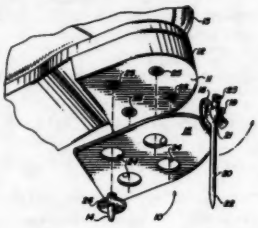
control means for receiving said weight signals and said reference signal and for generating a data output set representative of the change in weight distribution upon said first and second detection pads prior to, at, and subsequent to said event occurrence during said practice swing.

5,150,903

GOLFER'S TRAINING DEVICE

Adelio Percic, 210 E. Sharon Dr., Phoenix, Ariz. 85022

Filed Mar. 12, 1992, Ser. No. 851,006
Int. Cl.[5] A63B *69/36;* **A43B** *00/00*
U.S. Cl. 273—188 A **5 Claims**



1. A training device for holding a golfer's leading foot stable during a golf club swinging function comprising:

an apertured base plate,

said plate being secured to the bottom surface of the heel of a golf shoe by removing threaded cleats from internally threaded apertures in the bottom surface of the heel of the shoe, placing one surface of said plate against the bottom surface of the heel and inserting the removed cleats through the apertures in said plate for threadedly engaging with corresponding apertures in the heel of the shoe,

said plate having a tab extending laterally thereof for extending over a portion of the periphery of the back of the heel of the shoe,

said tab having an aperture extending therethrough,

a threaded bolt attached to and extending outwardly from said tab substantially parallel to said plate, and having a collar extending around a part thereof adjacent said tab,

an elongated spike one end of which pivotally surrounds said collar and the other end of which is provided with a point for penetrating the ground, and

means for threadedly engaging said bolt for holding said spike in a position extending laterally outwardly of said plate.

5,150,904

GOLF PUTTING TRAINING DEVICE

Joseph L. Sindelar, 2121 Hancock Dr., Horseheads, N.Y. 14845

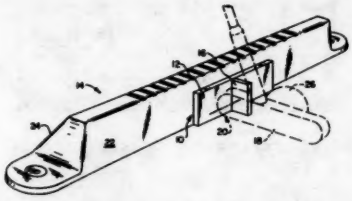
Continuation of Ser. No. 624,224, Dec. 7, 1990, Pat. No. 5,072,943, which is a continuation-in-part of Ser. No. 540,350, Jun. 19, 1990, Pat. No. 5,024,442. This application Oct. 2, 1991, Ser. No. 769,805
The portion of the term of this patent subsequent to Dec. 17, 2008, has been disclaimed.
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—192 **9 Claims**

1. A golf club assembly having a shaft, a golf club head defined at one end of said shaft and a handle defined at a second end of said shaft, said golf club head having a longitudinal axis, a toe end portion at a first longitudinal end thereof, a heel end portion at a second longitudinal end thereof, a stabilizer portion provided on said heel end portion, a forward face, and a rearward face;

said stabilizer portion having an inner side and a substantially flat, planer outer surface and including a base portion having a first end, a second end, and a longitudinal axis,

said outer surface of said stabilizer portion having a length substantially greater than a thickness of said toe end por-

tion of said golf club head, said longitudinal axis of said golf club head intersecting said planer outer surface of said stabilizer portion, said stabilizer portion being provided on said golf club head so that the plane of said outer surface is maintained perpendicular to a plane of said forward face, and so that said stabilizer portion is substantially immovable along said longitudinal axis of said golf



club head, so that said planer outer surface presents a first flat, planer surface for sliding engagement with a second flat, planer surface disposed adjacent the second longitudinal end of the golf club head and the forward face of the golf club head is controlled to be maintained square with respect to said second planer surface and a corresponding stroke direction when said planer outer surface is slid along said second planer surface.

5,150,905

RUBBER COMPOSITION AND GOLF BALL COMPRISING IT

Syoji Yuki, Osaka; Yasuyuki Tokui, Takatsuki; Kihachiro Nishiuchi, Tokushima; Kenichi Wada, Itano; Masayoshi Suzue, Tokushima, and Takuo Morimoto, Kyoto, all of Japan, assignors to Asics Corporation, Kobe and Otsuka Chemical Company, Limited, Osaka, both of, Japan

Division of Ser. No. 204,310, Jun. 9, 1988, Pat. No. 4,955,966. This application Jul. 11, 1990, Ser. No. 551,163

Claims priority, application Japan, Jun. 11, 1987, 62-146019; Jun. 12, 1987, 62-147218; Jun. 12, 1987, 62-147219; Jun. 12, 1987, 62-147220; Jun. 12, 1987, 62-147221

The portion of the term of this patent subsequent to Aug. 25, 2009, has been disclaimed.

Int. Cl.[5] A63D *37/06*; A63B *37/12*

U.S. Cl. 273—218 **6 Claims**

1. A rubber composition for a cover layer of a golf ball, which comprises at least one natural and/or synthetic rubber component(s) and alkali metal titanate fibers subjected to a surface treatment with about 0.05 to 10% by weight based on the weight of the fibers of a surface treating agent prior to mixing with said rubber component(s), said surface treating agent being selected from the group consisting of compounds represented by the formula I:

$$(HS-R^1\rightarrow_a Si-R^2 \quad (I)$$
$$\quad\quad\quad

players from the starting locations to the destination locations; and

f) repeating steps a)–e) in a given order by a given player.

5,150,908

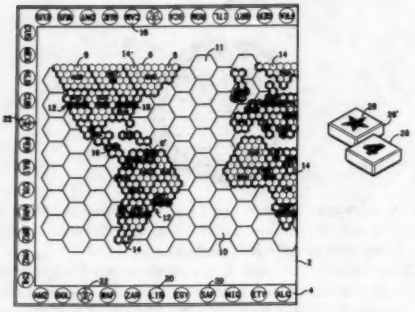
MILITARY CONFLICT BOARD GAME

J. Albert Codinha, 9260 Towne Center Dr., #27, San Diego, Calif. 92121-3008

Continuation-in-part of Ser. No. 347,289, May 4, 1989. This application Aug. 30, 1991, Ser. No. 753,306

Int. Cl.[5] A63F *3/00*

U.S. Cl. 273—262 **12 Claims**



1. A board game apparatus simulating international military conflict, which comprises:

a playing board comprising a map illustrating at least a portion of each of the principal oceans and nations of the world,

said map containing indicia assigning each of said nations to one of a plurality of continental regions;

the ocean portion of said map being overlaid by first network of cells and the land portion of said map being overlaid by a second network of cells,

each cell in said ocean network simulating coverage of a proportionately larger geographical area than each cell in said land network;

at least some of said nations illustrated on said map containing indicia designating missile facilities therein; and

said map being bordered by a path comprising a first plurality of spaces each identifying one of said nations and containing corresponding continental region indicia for each of said nations and regions and a second plurality of spaces denoting enhanced movement along said path;

first playing pieces for individual movement by each player along said path in the course of said game; second playing pieces representing individual military or naval forces in a nation or ocean;

third playing pieces designating nuclear annihilation of a nation; and

designators determining each player's permitted movement along said path at each point in said game;

each of said first pieces when moved along said path in response to the indication of one of said designators determining a military opportunity of the player represented by said piece with respect to the other players, said opportunity being determined by the path space on which said player's first piece resides after said movement and the number of said second pieces, third pieces, cells and missile facilities then associated with any nation indicated by said path space.

5,150,909

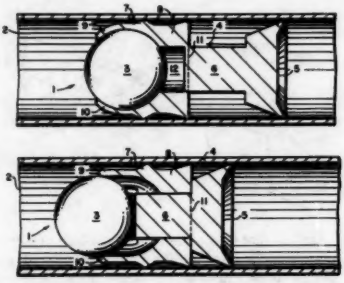
AIR GUN PELLET DESIGN

Edwin Fitzwater, 1370 Bryant St., Rahway, N.J. 07065

Filed Apr. 4, 1991, Ser. No. 680,432

Int. Cl.[5] F42B *6/10, 14/08*

U.S. Cl. 273—428 **8 Claims**



1. A gun pellet for use in a gun having a standard barrel of uniform diameter comprising:

a projectile and a skirt assembly;

said skirt assembly including means for removably retaining said projectile, and means for causing said projectile to disengage from the retention by said skirt assembly responsive to the force, and the consequence acceleration, developed within the standard gun barrel upon firing of the gun, such that disengagement of the projectile from the skirt assembly occurs before said projectile exits the open end of said standard gun barrel;

said skirt assembly further comprising:

a skirt body;

a shaft affixed to said skirt body; and

a projectile clutch assembly comprising a clutch body, at least two clutch jaws disposed about said projectile such that the projectile is removably retained within said clutch jaws, a retainer means disposed within said clutch body and detachably connected thereto, and a conduit disposed in said clutch body such that said shaft is capable of traversing through said conduit and propelling said projectile from said clutch jaws.

5,150,910

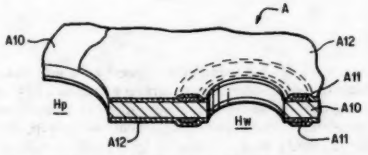
GASKET WITH SOFT AND HARD SEAL COATINGS

Tsunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1990, Ser. No. 546,930

Int. Cl.[5] F16J *15/06*

U.S. Cl. 277—235 B **8 Claims**



1. A gasket for sealing between two engine parts, comprising,

at least one main plate having at least one opening to be sealed therearound, and upper and lower surfaces,

hard coating formed on at least one of the upper and lower surfaces of the main plate and disposed around the opening with predetermined lateral width, said hard coating having hardness between H and 8H in pencil hardness and thickness between 2 and 100 micra so that aid hard coating

provides high surface pressure around the opening when the gasket is tightened, and

soft coating formed on at least one of the upper and lower surfaces of the main plate with the hard coating for covering a substantial area of the main plate, said soft coating having hardness between F and 8B in pencil hardness and thickness between 5 and 100 micra to provide sealing ability on the gasket so that when the gasket is tightened, the hard coating provides surface pressure around the opening and the soft coating supported by the hard coating closely seals around the opening.

5,150,911

TOW BAR ASSEMBLY

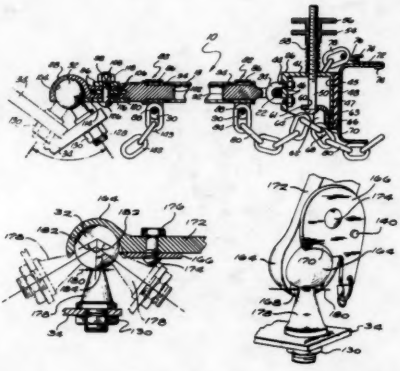
Gregory J. Williams, 523½ E. Sixth St., Reno, Nev. 89512

Continuation-in-part of Ser. No. 248,738, Sep. 23, 1988, Pat. No. 4,958,847. This application Sep. 24, 1990, Ser. No. 588,066

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.[5] B60D *1/167*

U.S. Cl. 280—502 **13 Claims**



1. A tow bar assembly for use with a tow vehicle having an undercarriage supporting structure used to tow a disabled vehicle, comprising:

two elongated tow bars, each of said bars having first and second ends, said first ends being removably attached to said disabled vehicle;

a ball member attached to a stem member and mounted on said supporting structure of said tow truck;

socket means engaged to said second ends of said tow bars for removably and rotatably engaging said tow bar assembly to said ball member on said supporting structure of said tow vehicle; and

rotating latch means rotatably and directly engaged to said socket means for removably securing said socket means to said ball member on said supporting structure, said rotating latch means including a single integral member rotatably and directly engaged to said socket means and adapted to rotate so that said integral member will come into contact with said ball member in order to removably secure said socket means to said ball member, said socket means and said rotating latch means having means for increasing rotation of said socket means with respect to said ball member and for allowing said socket means to rotate with respect to said ball member until said stem member comes into contact with said means for increasing rotation of said socket means and said rotating latch means, said means for increasing rotation comprising depressions in said socket means and said rotating latch means.

5,150,912

SKI BRAKE

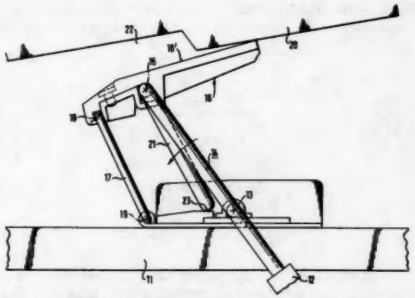
Christian Lucas, Nevers, and Roland Bardin, V. Vauzelles, both of France, assignors to Look S.A., Nevers cedex, France

Filed Jul. 29, 1991, Ser. No. 736,856

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1990, 4027712

Int. Cl.[5] A63C *7/10*

U.S. Cl. 280—605 **12 Claims**



1. Ski brake for preventing runaway of a ski (**11**) released from a ski boot, the ski brake comprising brake arms (**12**) which are pivotable against a spring deployment force about a transverse axis (**13**) between a braking position, in which they extend downwardly from the running surface of the ski, and a rest position, in which they lie above the ski running surface essentially parallel to the longitudinal direction of the ski, wherein the brake arms extend to the side of the ski in at least the braking position and are rotationally fixedly connected at the opposite side of the transverse axis (**13**) from their braking ends (**12**) to an actuating arm arrangement (**14**) which is arranged above the ski (**11**) and is pivotally connected at an end remote from the transverse axis to a pedal (**16**) about a second transverse axis (**15**) with the pedal being kept essentially parallel to the ski (**11**) in all positions of use by a linkage arrangement (**17**) which extends essentially parallel to the actuating arm (**14**) and which is pivotally connected to the pedal (**16**) at a distance in the longitudinal direction of the ski from the second transverse axis (**15**) about a third transverse axis (**18**) and is pivotally mounted at a point fixed with respect to the ski (**11**) at a distance in the same direction from the first transverse axis (**13**) about a fourth transverse axis (**19**), characterized in that the distance between the second and third transverse axes (**15, 18**) is smaller than the distance between the first and fourth transverse axes (**13, 19**) and the distance between the third and fourth transverse axes (**18, 19**) is essentially correspondingly smaller than the distance between the first and second transverse axes (**13, 15**) in such a way that the pedal (**16**) on being pivoted out of the braking position into the rest position is pivoted in the opposite direction to the direction of pivoting of the actuating arm (**14**) relative to the ski (**11**).

5,150,913

FINGER OPERATED BUTTON ACTIVATING WIRELESS TRANSMISSION PATH FOR EFFECTING VOLUNTARY RELEASE OF A SKI BINDING

Klaus Hoelzl, Vienna, Austria, assignor to TMC Corporation, Baar, Switzerland

Continuation-in-part of Ser. No. 318,457, Mar. 1, 1989, abandoned, which is a continuation of Ser. No. 939,644, Dec. 9, 1986, abandoned. This application Nov. 18, 1991, Ser. No. 798,257

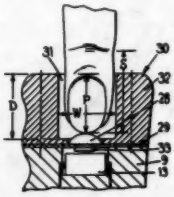
Claims priority, application Austria, Dec. 10, 1985, 3580/85

Int. Cl.[5] A63C *9/088*

U.S. Cl. 280—612 **6 Claims**

1. In a ski binding comprising a means for effecting a volun-

tary release of a lock mechanism on a jaw of a safety ski binding through a wireless transmission path, a switch means for operably controlling signal information in said wireless transmission path, said switch means including a manually operable button arranged on a base means separate from said safety ski binding and used in conjunction with said safety ski binding, the improvement wherein an outwardly opening recess means is provided on said base means, said button being located in said recess means so that a part thereof adapted to be manually engaged is oriented beneath an imaginary extension of the outer surface of said base means so as to protect said button from an unintentional manual engagement, support means on said base means for supporting the entirety of said button for



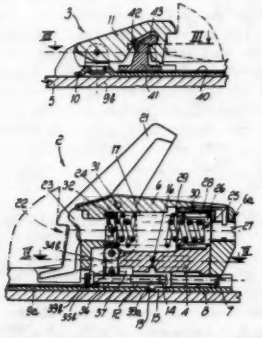
movement in the same direction relative to said base means, said recess means including surrounding wall means of finite dimensions defining a surface opening and a depth dimension to said button that is at least one of equal to and greater than a maximum width dimension for said surface opening, said surface opening having a cross sectional area sufficient to limit the reception of only one human finger into said surface opening, said depth dimension being sufficient to require a longitudinal axis of the finger to be generally aligned with a longitudinal axis of said recess means to enable the finger to be received into said recess means and to manually operate said button to cause said switch means to allow a transmission of signal information in said wireless transmission path to facilitate a release of said lock mechanism on a jaw of said safety ski binding.

5,150,914

FASTENING PARTICULARLY FOR SKIS

Roberto Gorza, Feltre, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Feb. 4, 1991, Ser. No. 650,357
Claims priority, application Italy, Feb. 6, 1990, 82518 A/90
Int. Cl.[5] A63C *9/08*
U.S. Cl. 280—616 **15 Claims**



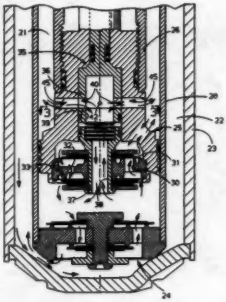
1. A fastening, particularly for skis, comprising a front engagement means for engaging a ski boot toe portion and a rear engagement means for engaging a ski boot heel portion, said front and rear engagement means both being mountable on a ski top portion which defines a separated distance therebetween, said rear engagement means comprising a pivoting heel locking element and a first adjustable biasing means for providing a first adjustable locking force acting on said pivoting heel locking element, said front engagement means comprising a pivoting tip locking element and a second adjustable biasing means for providing a second adjustable locking force acting on said pivoting tip locking element, said first adjustable biasing means comprising a first spring means and said second adjustable biasing means comprising a second spring means, wherein said rear engagement means comprises means for housing both of said first spring means and said second spring means, and wherein the rear engagement means further comprises means for simultaneously adjusting both said first and second adjustable locking forces.

5,150,915

MOTOR VEHICLE SUSPENSION WITH DAMPER HAVING ROTATABLE MEMBER POSITION FEEDBACK

David A. Hoptry, Grand Blanc, Mich.; James M. Petrofes, Tipp City; David A. Shal, Centerville, all of Ohio, and Gary R. Denton, Erie, Pa., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1991, Ser. No. 746,643
Int. Cl.[5] B60G *11/26*
U.S. Cl. 280—707 **7 Claims**



1. A motor vehicle suspension system having a damper with a rotatable member producing separate discrete damping characteristics in a plurality of rotational positions, a motor adapted to drive the rotatable member through the rotational positions, and position feedback apparatus comprising, in combination:

a contact pad for each of the rotational positions of the rotatable member, the contact pads being separated by electrically insulating regions;

an electric contact member adapted for circular movement by the motor relative to the contact pads to contact the contact pads alternately with the insulating regions with such movement, the contact member contacting one of the contact pads with the rotatable member in each of the rotational positions;

electric circuit means connected to the contact pads and electrical contact member for generating an output voltage in a first voltage range when the electric contact member contacts any of the insulating regions, a second voltage range when the electric contact member contacts one of the contact pads defining a home position of the rotatable member and a third voltage range when the electric contact member contacts any of the remainder of the contact pads;

counting means responsive to the electric circuit means to change a count in response to a predetermined transition of the output voltage from the first range to either of the second and third ranges as the electric contact member contacts each of the contact pads, specific values of the count corresponding to rotational positions of the rotatable member; and

correction means responsive to the electric circuit means to establish a first predetermined value of the count corresponding to the home position of the rotatable member when the output voltage is in the second voltage range, whereby an error of the counting means is corrected.

5,150,916

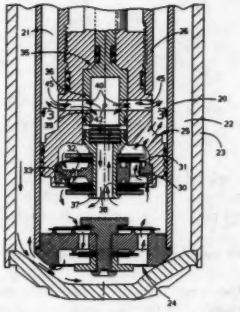
MOTOR VEHICLE SUSPENSION WITH DAMPER HAVING ROTATABLE MEMBER OVERRUN DETECTION

James M. Petrofes, Tipp City; David A. Shal, Centerville, both of Ohio; Gary R. Denton, Erie, Pa., and David A. Hoptry, Grand Blanc, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1991, Ser. No. 746,644

Int. Cl.[5] B60G *11/26*

U.S. Cl. 280—707 **2 Claims**



1. A motor vehicle suspension system having a damper with a rotatable member producing separate discrete damping characteristics in a plurality of rotational positions, a motor adapted to drive the rotatable member through the rotational positions, and position feedback apparatus comprising, in combination:

a contact pad for each of the rotational positions of the rotatable member, the contact pads being separated by electrically insulating regions;

an electric contact member adapted for circular movement by the motor relative to the contact pads to contact the contact pads alternately with the insulating regions with such movement, the contact member contacting one of the contact pads with the rotatable member in each of the rotational positions;

electric circuit means connected to the contact pads and electrical contact member for generating an output voltage in a first voltage range when the electric contact member contacts any of the insulating regions and a second voltage range when the electric contact member contacts any of the contact pads;

means for repeatedly sampling the output voltage and determining whether it is within the first voltage range or the second voltage range;

means for selecting one of the contact pads, activating the motor to rotate the rotatable member toward the selected contact pad, and deactivating the motor when the sampled output voltage changes from the first voltage range to the second voltage range at the selected contact pad to stop rotation of the rotatable member; and

overrun detection means responsive to a predetermined change of the sampled output voltage from the second voltage range to the first voltage range after deactivation of the motor at the selected contact pad to restart the motor so as to resume rotation of the rotatable member toward the selected contact pad.

5,150,917

ACTIVE SUSPENSION SYSTEM WITH CONTROL TO CHANGE VARIATION IN PRESSURE OF WORKING FLUID CYLINDER BETWEEN INCREASE AND DECREASE THEREOF

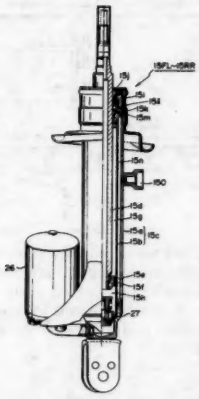
Kazunobu Kawabata, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed May 28, 1991, Ser. No. 706,443

Claims priority, application Japan, May 31, 1990, 2-142854

Int. Cl.[5] B60G *11/26*; B60S *9/00*

U.S. Cl. 280—707 **7 Claims**



1. An active suspension control system for a vehicle, comprising:

sensor means for sensing vehicle attitude change to provide a signal indicative thereof;

suspension assemblies including actuators which are respectively disposed between a vehicle body and suspension members supporting vehicle wheels rotatably, each of the actuators including a sliding member which slides in the actuator to adjust a relative distance between the vehicle body and the suspension member to suppress a vehicle attitude change;

a fluid power source unit which supplies pressurized fluid to the actuators for displacing the sliding member dependent upon the magnitude of fluid pressure; and

pressure control means responsive to the signal from said sensor means for controlling the fluid pressure supplied from said fluid power source unit of the actuators dependent upon an amount of vehicle attitude change to suppress said vehicle attitude change, said pressure control means decreasing the fluid pressure to the actuator associated with a portion of the vehicle body which is rising during the vehicle attitude change by a first ratio and increasing the fluid pressure to the actuator associated with a portion of the vehicle body which is lowering during the vehicle attitude change by a second ratio smaller than the first ratio by a preselected value for restricting friction caused by increase an in the fluid pressure in the actuator which impinges upon sliding movement of the sliding member.

5,150,918

TRAILING ARM SUSPENSION FOR VEHICLE

David E. Heitzmann, Union, Mich., assignor to MOR/ryde International, Inc., Elkhart, Ind.

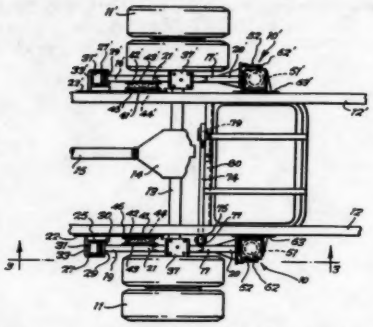
Filed May 1, 1991, Ser. No. 694,207

Int. Cl.[5] B60G *11/22*

U.S. Cl. 280—716 **19 Claims**

1. In a vehicle having a frame including a frame portion which extends longitudinally of said vehicle and an axle posi-

tioned under the frame, a trailing arm axle suspension comprising an elongated trailing arm having fore and aft and central portions extending longitudinally of said vehicle, first means for pivotally mounting said fore portion directly on and laterally offset from said frame portion, shear rubber spring means, second means for mounting said shear rubber spring means



directly between and laterally offset from both said central portion of said trailing arm and said frame portion, third means for securing said axle to said central portion of said trailing arm, spring means, and fourth means for securing said spring means directly between said frame portion and said aft portion of said trailing arm.

5,150,919

AIR BAG SYSTEM FOR VEHICLE

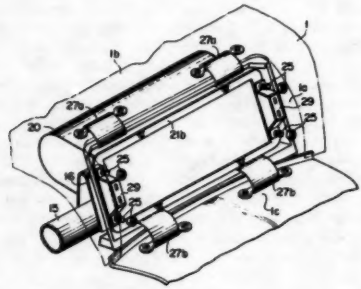
Masafumi Sakakida; Yasunori Iwamoto; Toshiyuki Manabe, all of Hiroshima; Hisao Muramoto, Yamaguchi; Haruhiro Inada, Hiroshima; Isao Hirashima, Hiroshima, and Kazuhiro Ushijima, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 28, 1990, Ser. No. 573,786

Claims priority, application Japan, Aug. 30, 1989, 1-223885; Feb. 1, 1990, 2-20390; Feb. 26, 1990, 2-42687; Mar. 27, 1990, 2-75519; Mar. 29, 1990, 2-78701

Int. Cl.[5] B60R *21/16*

U.S. Cl. 280—732 **21 Claims**



1. An air bag system comprising

an instrument panel provided with an opening in the vicinity of a passenger's seat,

an air bag unit disposed in the opening and provided with an air bag and a casing for receiving the air bag,

lid means disposed at a rear end of the casing for covering the opening,

at least a pair of connecting means spaced transversely for connecting the lid means with the instrument panel,

one end of each of the connecting means being mounted on the lid means at a position offset from a transverse center line of the lid means.

5,150,920

STEERING WHEEL

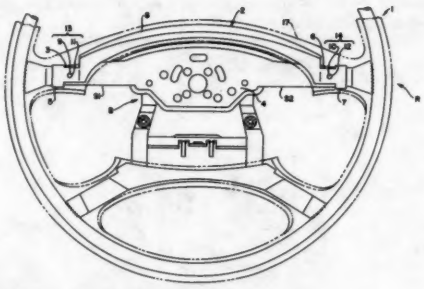
Yoshiyuki Fujita, and Katsunobu Sakane, both of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jun. 19, 1991, Ser. No. 717,796

Claims priority, application Japan, Jul. 9, 1990, 2-181075

Int. Cl.[5] B62D *1/11*

U.S. Cl. 280—777 **4 Claims**



1. A steering wheel comprising:

a boss member;

a ring member provided in surrounding relation to said boss member;

a pair of spoke members connecting said boss member to said ring member;

an energy absorbing means for absorbing energy of an impact force subjected thereto, said energy absorbing means having first and second ends, said first end being fixed to one of said spoke members of said pair which extends in a first direction from said boss member to said ring member, said second end being fixed to the other one of said spoke members of said pair which extends in a second direction from said boss member to said ring member, said energy absorbing member being laterally offset from said boss member; and

a cover layer continuously and integrally covering said energy absorbing means, said ring member and at least a portion of said spoke members such that said boss member remains uncovered by said covering layer and thus is exposed.

5,150,921

FREE-ENDED BOOK MARK

Horace N. Broyles, 6981 Arbor Dr., Frederick, Md. 21701

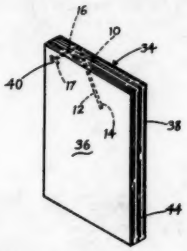
Filed Aug. 12, 1991, Ser. No. 744,353

Int. Cl.[5] B42D *9/00*

U.S. Cl. 281—42 **5 Claims**

1. The combination of a book and a selectively detachable book mark, wherein the combination comprises: a book having front and back covers and a body having opposed front and back end faces and being of a predetermined number of pages contained therebetween, said pages each having an upper edge, a lower edge, and an inner margin, said book further having at least one series of aligned apertures provided through said book pages so as to form a continuous passage within said book through said body; and a book mark which is moisture proof and of thin, stiff character and which is adapted for reasonable flexibility, said book mark comprising an elongated body terminating in opposed free ends and having a length substantially greater than the length of the passage formed by said aligned apertures, said book mark being threaded through said series of apertures in said book body of pages, and an anchoring element fixed to one free end, the anchoring element being of greater

cross section than a cross section of said apertures and being adapted for bringing into abutment against the corresponding end face of the book body at the inner margin, to thereby prevent complete passage in one direction of said book mark, said other free end of said book mark projecting beyond the



end of the passage opening through the other end face of the book body, and having a cross section smaller than the cross section of said apertures so as to be at all times free to pass through said apertures, and being relatively withdrawn from the book body as the book is continuously opened to the pages perused.

5,150,922

ELECTROFUSION JOINT AND HOT WATER SUPPLY HEADER USING THE SAME

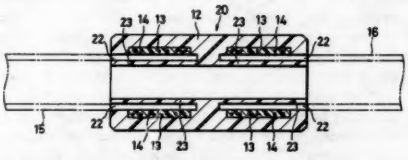
Akio Nakashiba; Hiroyuki Nishimura, both of Osaka; Fumio Nagatani; Kazunori Mito, both of Kuga; Toshio Shibabuchi, and Mikio Nakaoka, both of Osaka, all of Japan, assignors to Osaka Gas Co., Ltd., Osaka; Mitsui Petrochemical Ind., Ltd., Tokyo and Shinwa Sangyo Co., Ltd., Osaka, all of, Japan

Filed Jan. 9, 1990, Ser. No. 462,717

Claims priority, application Japan, Jan. 11, 1989, 1-4496; Mar. 24, 1989, 1-72331; Mar. 24, 1989, 1-72332; Mar. 24, 1989, 1-72333; Mar. 24, 1989, 1-72337; Mar. 24, 1989, 1-72340; Mar. 28, 1989, 1-75955; Mar. 28, 1989, 1-75960

Int. Cl.[5] F16L *47/02*

U.S. Cl. 285—21 **10 Claims**



1. An electrofusion joint comprising

a main body portion comprised of a crosslinked thermoplastic resin, said main body portion having an interior surface and an exterior surface;

at least one joining portion comprising a non-crosslinkable thermoplastic resin embedded in the interior surface of said main body portion without extending to the extreme end of the electrofusion joint, said joining portion having an electrical heating wire associated in contact therewith so that the joining portion may be heat-welded to a pipe brought into contact with said joining portion; and

a supporting portion molded as one piece member with said main body portion of the joint and comprising the crosslinked thermoplastic resin, a groove into which the pipe is to be inserted being defined between the supporting portion and the interior surface of said main body portion wherein the joining portion is embedded.

5,150,923

PLASTIC PIPE JOINT ASSEMBLY FOR JOINING SECTIONS OF PLASTIC PIPE

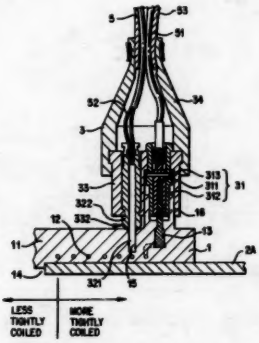
Hiroshi Ohya, Gifu, and Takeshi Kato, Mie, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation of Ser. No. 209,808, Jun. 22, 1988, abandoned. This application Jan. 22, 1990, Ser. No. 467,341

Claims priority, application Japan, Jun. 29, 1987, 62-99888[U]; Oct. 29, 1987, 62-273907; Oct. 29, 1987, 62-273908; Jan. 7, 1988, 63-1732

Int. Cl.[5] F16L *13/02*

U.S. Cl. 285—21 **28 Claims**



1. A plastic socket pipe joint assembly for joining sections of plastic pipe, comprising:

a plastic socket joint body having an inner surface and an outer surface, said inner surface receiving the ends of the sections of plastic pipe;

an electric heating wire embedded near the inner surface of said plastic socket joint body, said electric heating wire being coiled more tightly at the ends of said joint body than at the middle thereof;

a first connector pin electrically connected to one end of the electric heating wire and a second connector pin electrically connected to the other end of the electric heating wire;

current supply means adapted to be connected to the first and second connector pins to enable a current to flow through said electric heating wire;

a first recess provided in said joint body proximate the first connector pin and a second recess provided in said joint body proximate the second connector pin, said first and second recesses being disposed near said electric heating wire;

temperature sensing means provided in each of the first and second recesses, respectively, for sensing the temperature of the joint body proximate the first and second connector pins;

a first fusion welding plug engaging the first connector pin and the first recess and a second fusion welding plug engaging the second connecting pin and the second recess; and

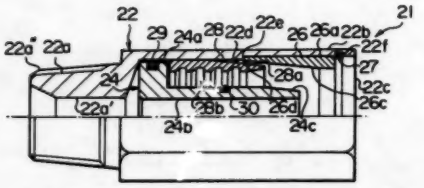
control means operatively connected to the temperature sensing means comprising means for disabling the current supply means to discontinue the supply of current to the first and second connector pins when said joint body has reached a first predetermined temperature, and means for indicating when the joint body has reached a second predetermined temperature, after the supply of current has been discontinued, where the second predetermined temperature is defined by the temperature at which the fusion welding plugs may be removed from the plastic joint body.

5,150,924

HOSE FITTING

Takahiro Yokomatsu; Kenji Mine, and Shinichiro Kato, all of Tokyo, Japan, assignors to Bridgestone Flowtech Corporation, Tokyo, Japan

Continuation of Ser. No. 471,677, Jan. 25, 1990, abandoned, which is a continuation of Ser. No. 230,869, Aug. 11, 1988, abandoned. This application Feb. 1, 1991, Ser. No. 649,341
Claims priority, application Japan, Sep. 29, 1987, 62-246770; Aug. 3, 1988, 63-55389
The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.
Int. Cl.[5] F16L *33/16*
U.S. Cl. 285—101 6 Claims



1. A hose fitting for sealed connection to a multilayer hose, comprising:

a first, one-piece cylindrical member having a small diameter bore portion and a large diameter cylindrical bore portion connected to said small diameter bore portion, the small diameter bore portion being formed with an axial small bore extending therethrough, and the large diameter bore portion being formed with an axial large bore extending therethrough and having an inner peripheral surface;

a second cylindrical member provided within said large diameter bore portion of said first cylindrical member and having a radial flange portion and an axial tubular portion extending from said radial flange portion, the radial flange portion being provided with a first sealing member and being axially slidably received through said sealing member on said inner peripheral surface of said large diameter bore portion of said first cylindrical member, and the axial tubular portion being formed with a through bore communicating with said axial small bore of said small diameter bore portion of said first cylindrical member and provided with a second sealing member, said first sealing member serving so that said second cylindrical member is axially slid along and on said large diameter cylindrical bore portion of said first cylindrical member, as a piston, when internal pressure is applied to said hose fitting;

a sleeve axially fixedly mounted in said large diameter bore portion in a fixed position relative to said small diameter bore portion and rotatably received in said large diameter bore portion and having an inclined surface;

a collet provided within said large diameter bore portion and between said sleeve and said radial flange portion and having an outer surface engageable with said inclined surface of said sleeve and radially constrictible when moving axially outwardly within said sleeve, the multilayer hose being firmly fixed between said collet and said axial tubular portion of said second cylindrical member by the axial and outward movement of said second cylindrical member and said collet by internal fluid pressurization of the hose fitting; and

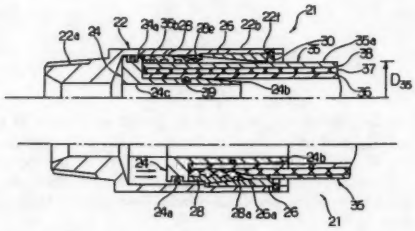
a stop member received in said large diameter bore portion and adapted to limit axial movement of said sleeve and collet.

5,150,925

HOSE FITTING

Takahiro Yokomatsu; Kenji Mine, and Shinichiro Kato, all of Tokyo, Japan, assignors to Bridgestone Flowtech Corporation, Tokyo, Japan

Filed Sep. 25, 1990, Ser. No. 587,975
The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.
Int. Cl.[5] F16L *33/16*
U.S. Cl. 285—101 11 Claims



1. A hose fitting comprising:

a first cylindrical member having a small diameter bore portion and a large diameter bore portion connected to said small diameter bore portion, the small diameter bore portion being formed with an axial small bore extending therethrough and the large diameter bore portion being formed with an axial large bore extending therethrough;

a second cylindrical member axially slidable within said large diameter bore portion of said first cylindrical member and having a radial flange portion and an axial tubular portion extending from said radial flange portion, the radial flange portion being provided with a sealing member and the axial tubular portion being formed with a through bore communicating with said axial small bore of said small diameter bore portion of said first cylindrical member and provided with a sealing member;

a sleeve provided within said large diameter bore portion and having an inclined surface;

an axially movable and radially constrictible collet provided between said second cylindrical member and said sleeve and having an outer surface engageable with said inclined surface of said sleeve, the collet being further formed at its inner circumferential portion with a first annular projection with an inner circumferential edge having an inner diameter no greater than the outer diameter of said hose and formed with a plurality of second annular projections each having a land portion having an inner diameter at least equal to the inner diameter of said inner circumferential edge;

said inner circumferential edge of said collet being adapted to bite on said hose when no internal fluid pressure is applied within said small diameter bore portion of said first cylindrical member and when said hose is pulled out axially outwardly;

said hose being firmly fixed between said collet and said axial tubular portion of said second cylindrical member by axial and outward movement of said collet which is caused by axial and outward movement of said second cylindrical member when an internal fluid pressure is applied within said small diameter bore portion of said first cylindrical member; and

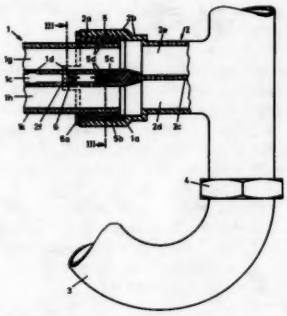
a stop member received in said large diameter bore portion and adapted to limit axial movement of said sleeve and collet.

5,150,926

DOUBLE PIPE CONNECTION ON PLASTIC PIPES

Anton Egli, Rieden, Switzerland, assignor to Geberit AG, Switzerland and "Keramag" Keramischewerke AG, Fed. Rep. of Germany

Filed Mar. 5, 1991, Ser. No. 665,405
Claims priority, application Switzerland, Mar. 6, 1990, 716/90
Int. Cl.[5] F16L *17/025*
U.S. Cl. 285—110 11 Claims



4. A pipe connection, comprising:

a first pipe having two channels separated by an intermediate space;

a one piece second pipe being divided into two channels by an inner wall;

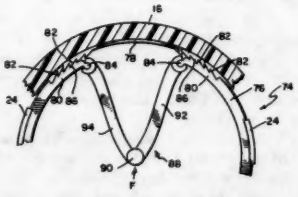
a gasket having a circumferential wall and a partition, said gasket circumferential wall being fittable over said first pipe and said partition being fittable into said intermediate space, said gasket partition having a forward end defining a cavity, said inner wall extending into said cavity, said circumferential wall being fittable into said second pipe.

5,150,927

EXPANDABLE SEAL ARRANGEMENT

William O. Skinner, Fort Wayne, Ind., assignor to Press Seal Gasket Corporation, Forty Wayne, Ind.

Filed Jan. 22, 1991, Ser. No. 643,429
Int. Cl.[5] F16L *21/00*
U.S. Cl. 285—189 18 Claims



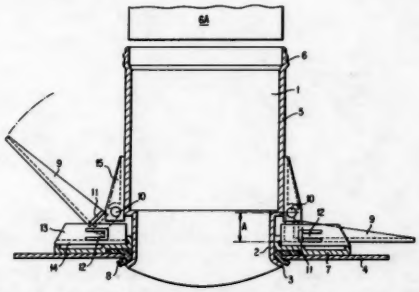
1. A compression sleeve capable of transmitting an outwardly, radially directed force to an inner surface of a tubular gasket for radially expanding the tubular gasket into compressive sealing engagement with the wall of an opening, comprising a first portion formed as a continuous strip of resiliently flexible material which comprises means for expanding said first portion from a first relaxed position to at least one expanded position, and a second portion for locking the first portion in said at least one expanded position, said first portion comprising a C-shaped strip of material having an outer circumference which defines more than 180 degrees, but less than 360 degrees, of the compression sleeve in the expanded position.

5,150,928

COUPLING SLEEVE FOR CONNECTION OF A BRANCH PIPE TO A MAIN PIPE

Bernhard Lodder, Hardenberg; Berend J. van Dijk, Slagharen; Adriaan Paulen, Zwolle, and Albertus A. Oostenbrink, Hardenberg, all of Netherlands, assignors to Wavin B.V., Netherlands

PCT No. PCT/NL88/00030, § 371 Date Dec. 21, 1989, § 102(e) Date Dec. 21, 1989, PCT Pub. No. WO88/10392, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 20, 1988, Ser. No. 460,321
Claims priority, application Netherlands, Jun. 23, 1987, 8701464; Mar. 1, 1988, 8800527
Int. Cl.[5] F16L *41/00*
U.S. Cl. 285—205 6 Claims



1. A coupling sleeve for connection of a branch pipe to a main pipe comprising: said coupling sleeve having a connecting end and an insertion end with a radially outwardly flanged edge which is inserted into an opening in said main pipe, an annular sealing means of resilient material for sealingly engaging said coupling sleeve and said main pipe disposed around the insertion end and resting against the flanged edge which can deform through the exertion of compressive stress occurring when fixing the insertion end in sealing fashion in the opening in said main pipe, a stop part positioned on the side of said opening opposite said flanged edge and defining a recess with said main pipe wall for receiving said sealing means and wherein said stop part rests against the external surface of said main pipe, stretching elements for moving said outwardly flanged edge in a direction outward relative to the wall of said main pipe and for exerting said compressive stress on said resilient sealing means while said resilient sealing means are confined between the flanged edge of the insertion end and said recess and wherein the stretching means comprises at least two identical lever stretching elements which are provided at equal spaced intervals about the periphery of the coupling sleeve.

5,150,929

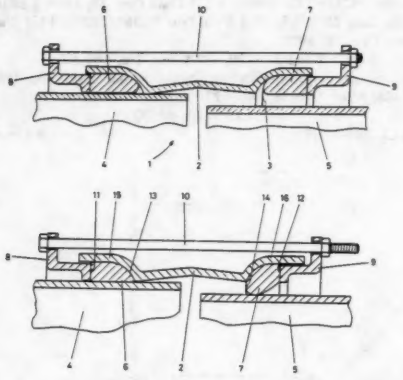
PIPE JOINTS

Cyril B. Greatorex, Stapleford, United Kingdom, assignor to Stanton plc, United Kingdom

Continuation of Ser. No. 488,087, filed a PCT/GB88/01132, Dec. 19, 1988, abandoned.
This application Aug. 6, 1991, Ser. No. 742,059
Claims priority, application United Kingdom, Jan. 6, 1988, 8800245
Int. Cl.[5] F16L *21/04*
U.S. Cl. 285—231 9 Claims

1. A pipe joint comprising a sleeve (2) surrounding a socket chamber (3) for receiving a spigot (5), a sealing ring (7) for positioning between the sleeve (2) and the spigot (5), the sealing ring having an axially directed nose portion and an undercut portion spaced from the spigot when the sealing ring is in an unloaded state and a gland (9) around the spigot (5) for applying a load to the sealing ring (7) by axially moving the

gland (9) against a trailing heel portion (12) of the sealing ring (7), wherein the heel portion includes an inner diameter of a first size, characterized in that when the gland (9) applies a load to the sealing ring (7), the undercut portion is deflected radially inwardly together with the nose portion (14) of the



sealing ring (7) such that the nose portion is at least partially radially directed by the internal profile of the sleeve (2) against the external surface of the spigot (5), wherein the nose portion has an inner diameter of a second size less than said first size, whilst the inner diameter of the heel portion (12) of the sealing ring (7) maintains substantially said first size.

5,150,930

CORRUGATED PIPE CONNECTOR AND METHOD OF MOLDING

John Petty, Bonnet Bay, and Sandy McNeil, Hunters Hill, both of Australia, assignors to Elconnex Pty Limited, Bonnet Bay, Australia

PCT No. PCT/AU88/00292, § 371 Date May 8, 1989, § 102(e) Date May 8, 1989, PCT Pub. No. WO89/01109, PCT Pub. Date Feb. 9, 1989

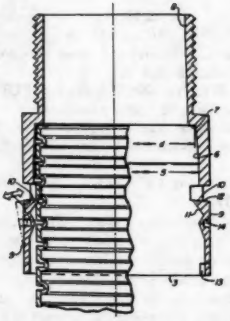
Continuation of Ser. No. 342,515, May 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 137,539, Nov. 17, 1987, Pat. No. 4,923,227. This PCT application Aug. 4, 1988, Ser. No. 668,706

Claims priority, application Australia, Aug. 4, 1987, PI3598

The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.

Int. Cl.[5] F16L *37/12*

U.S. Cl. 285—319 **22 Claims**



1. A one-piece plastic connector, for affixing, in a liquid tight manner, to a conduit, having a ridge located adjacent its end, comprising:

a body open at one end to receive a conduit in a bore communicating with said open end;

sealing means, in said bore, remote from said open end, which are adapted to seal against, in a liquid tight manner, the conduit pushed into the said bore; and

locking means located in said body so as to project into the said bore so as to lock onto the ridge of conduit in said bore, so as to hold in said bore said conduit in a liquid tight seal against the said sealing means, wherein said locking means comprises:

an axially extending resilient finger, having a projection located at its free end being remote from the open end and which projects into the bore; and

an axially extending recess located in the bore, which extends from the base of the finger toward the open end, said recess acting to move the moment arm of the finger radially outwardly to enhance the over-center action of the finger;

wherein a force attempting to withdraw the conduit from the connector causes the projection of the finger to more firmly and deeply resiliently engage and retain said ridge such that a greater withdrawal force results in a firmer and deeper engagement with said ridge.

5,150,931

PIPE COUPLING USING SHAPE MEMORY ALLOY WITH INNER SOLDER FOIL MEMBER

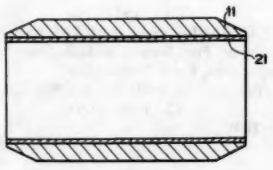
Akira Hagio; Yoshimi Ono, and Hiroshi Honma, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Dec. 4, 1989, Ser. No. 445,783

Claims priority, application Japan, Jul. 14, 1989, 1-082143[U]

Int. Cl.[5] F16L *25/00*

U.S. Cl. 285—381 **2 Claims**



1. A pipe coupling comprising:

a cylindrical coupling member fabricated of a shape memory alloy, said cylindrical coupling member having an internal surface, and said shape memory alloy having a shape recovery temperature;

a metallic foil member of low melting point on said internal surface of said cylindrical coupling member;

said metallic foil member having a melting point which is lower than the shape recovery temperature of said shape memory alloy;

said foil being made of soft solder, said soft solder consisting essentially of 3 to 5 wt. % Ag and 97 to 95 wt. % Sn., and said soft solder having a melting point ranging from 200° to 250° C.; and wherein

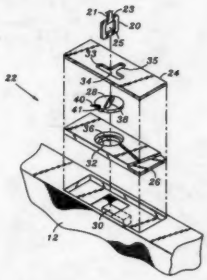
when a pipe is inserted in said cylindrical coupling member, and said pipe coupling is heated to contract said cylindrical coupling member in the radial direction thereof, said metallic foil member melts and penetrates voids in said cylindrical coupling member and pipe inserted therein, and thereafter solidifies by cooling to provide a seal between said cylindrical coupling member and said pipe inserted therein.

5,150,932

CENTRIFUGE LID SAFETY LOCK

Thomas E. Conn, Palo Alto, and Benson Kwan, Saratoge, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 14, 1991, Ser. No. 640,657
Int. Cl.[5] E05B *3/04*
U.S. Cl. 292—202 **20 Claims**



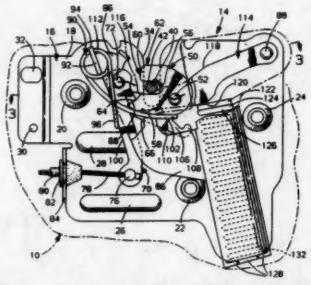
1. A lock for a lid on a housing of a centrifuge comprising:
a striker attached to the lid, the striker having a narrow portion and a wide depending end;
a member having an aperture sized to receive the wide depending end; the member being rotatably supported on the housing such that the member can be rotated from a first position where the depending end can be slid through the aperture to a second position where the depending end cannot be slid through the aperture, whereby by inserting the striker through the aperture of the member in its first position such that the wide depending end of the striker is past the member and the narrow portion of the striker is within the aperture of the member, and turning the member to the second position, the striker is restricted from being withdrawn through the aperture thereby locking the lid.

5,150,933

LATCH HAVING TORSION SPRING LEG AND LEAF SPRING LEG

Robert J. Myslicki, W. Bloomfield; Hecham R. Khalid, Dearborn Heights, and Michael E. Aubry, Shelby, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 29, 1991, Ser. No. 783,070
Int. Cl.[5] E05C *3/26*
U.S. Cl. 292—216 **4 Claims**



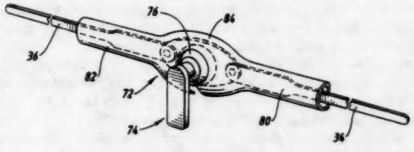
1. A latch assembly for latching and unlatching a pivotally movable closure panel of an automotive vehicle comprising:
a housing which is adapted to be mounted to a vehicle body structure of the vehicle adjacent to a striker on the closure panel;
a locking lever pivotally supported on the housing by a first pivot means for movement between an over-slam position in which an engaging portion thereof is latched to the striker on the closure panel and an unlatched position in which the engaging portion releases the striker to allow the closure panel to be moved toward an open position and through a latched position located between the over-slam position and the unlatched position and in which the engaging portion thereof is latched to the striker on the closure panel to hold the latter in its closed position;
a detent lever pivotally supported on the housing by a second pivot means for movement between an engaged position in which a first portion thereof engages the locking lever to retain the latter in its latched position and a released position in which the first portion thereof releases the locking lever to allow the latter to be moved to its unlatched position and the detent having a manually manipulable release means operatively associated with the detent lever for moving the latter from the engaged position to the released position; and
a spring having a coil portion carried by the housing distant from the first pivot means and the spring having a first leg, acting as a torsion spring, engaging the detent lever for biasing the detent lever towards the engaged position and having a second leg including an end and the end engaging the locking lever and the end being stationary relative to the locking lever when the locking lever is between the over-slam position and the latched position so that the second leg biases the locking lever towards the latched position and the end slideably engaging the locking lever when the locking lever is between the latched position and the unlatched position so that the second leg biases the locking lever towards the unlatched position whereby the locking lever is held in the latched position by the detent lever biased in the engaged position by the spring and when the detent lever is manually manipulable to the released position the spring rotates the locking lever to the unlatched position releasing the striker.

5,150,934

SHELL DOOR LOCKING DEVICE

Steven Grody, 427 Colyton St., #205, Los Angeles, Calif. 90013

Filed May 30, 1991, Ser. No. 707,698
Int. Cl.[5] E05C *5/00*
U.S. Cl. 292—288 **12 Claims**



1. A device for locking the door of a pick-up truck shell of the type having a door latching mechanism provided with a rotatable cam and an arm pivotally connected to the cam for pivotal movement with respect to the cam upon rotation of the cam, the arm having an end portion movable between a latched position and an unlatched position upon rotation of the cam, the device comprising:
a substantially rigid member having a first portion for abutting the cam and a second portion for abutting the arm of the latching mechanism;
means for fixing the first portion of the substantially rigid member with respect to the cam upon the first portion abutting the cam; and
means for fixing the second portion of the substantially rigid member with respect to the arm of the latching mechanism upon the second portion abutting the arm and while

the first portion of the substantially rigid member is fixed with respect to the cam;

wherein the substantially rigid member prohibits pivotal movement of the arm with respect to the cam upon the substantially rigid member being simultaneously fixed with respect to the cam and arm.

5,150,935

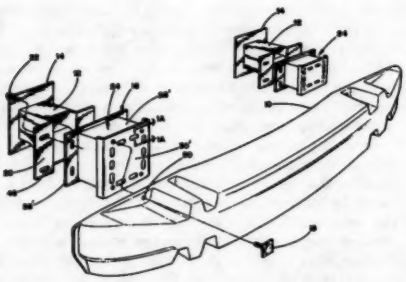
ELASTOMERIC ENERGY ABSORBING MECHANISM FOR VEHICLE BUMPERS

Patrick M. Glance, Plymouth, and Paul Glance, Troy, both of Mich., assignors to Concept Analysis Corp., Plymouth, Mich.

Filed Nov. 6, 1990, Ser. No. 612,588

Int. Cl.[5] B60R *19/30*

U.S. Cl. 293—136 **33 Claims**



1. An improved elastomeric energy absorber unit for a vehicle system, wherein the elastomeric energy absorber unit is mounted between a bumper beam and a fixed position vehicle rail so as to permit resilient, energy absorbing deflection of the bumper beam with respect to the vehicle rail within predetermined force and deflection limits designed to minimize damage to the vehicle, the elastomeric energy absorber unit comprising a resiliently collapsible energy absorbing block formed of an elastomeric material, the block having an egg crate configuration comprising a plurality of substantially parallel elongated tubular channels extending axially between front and rear ends of the block, with elastomeric walls separating adjacent channels, each channel and the walls forming the periphery thereof being a cell, the block being offset from the center of the vehicle and having an inboard side designed to face inwardly toward the center of the vehicle and an outboard side designed to face outwardly toward the side of the vehicle, the inboard and outboard sides of the block each including means for resisting axial collapse thereof, the inboard means providing greater resistance to axial collapse than the outboard means, such that the inboard side of the block is more resistant to axial collapse than the outboard side of the block, the block resisting inward bending moments and urging the block to collapse axially in a front to rear direction in response to an impact load at the center of the bumper team.

5,150,936

GRAPPLE ASSEMBLY FOR ATTACHMENT TO WORKHEAD

Neal H. Avery, P.O. Box 348, West Concord, Minn. 55985

Filed Jan. 17, 1991, Ser. No. 645,184

Int. Cl.[5] B66C *3/04*

U.S. Cl. 294—104 **15 Claims**

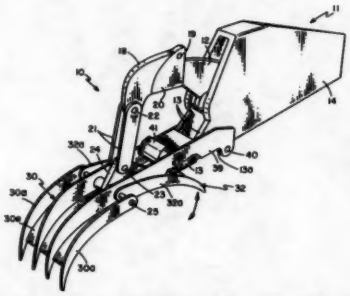
1. A grapple attachment for a demolition shear that permits the demolition shear to open and close a grapple comprising:

a first member having a first sleeve for extending partially around a first jaw of a demolition shear, means on said first member for engaging the first jaw to hold said member on the first jaw;

a second member having a second sleeve for extending partially around a second jaw of the demolition shear, further means on said second member for engaging the second jaw of the demolition shear to hold said second member on said second jaw of the demolition shear;

a first grapple jaw connected to said second member;

a second grapple jaw pivotally connected to said first grapple jaw; and



link means connected to said first jaw and to said second grapple jaw so that movement of said first jaw of the demolition shear toward said second jaw of the demolition shear causes said second grapple jaw to pivot toward said first grapple jaw to thereby enable an operator to pick up an article between said first grapple jaw and said second grapple jaw solely through the movement of said first jaw of the demolition shear toward said second jaw of the demolition shear.

5,150,937

WORK PICKUP APPARATUS

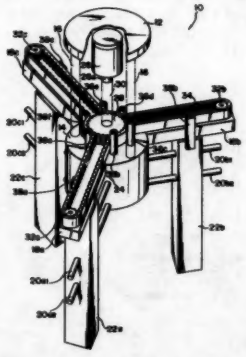
Takeshi Yakou, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1990, Ser. No. 578,344

Claims priority, application Japan, Sep. 7, 1989, 1-230412; Sep. 3, 1990, 2-230604

Int. Cl.[5] B25J *15/10*

U.S. Cl. 294—119.1 **11 Claims**



1. A work pickup apparatus, comprising:

a hand main body;

at least first, second and third arm members extending radially from said main body;

angle changing means for changing an angle defined between at least first and second adjacent arm members;

a finger member disposed on each of said arm members and

being supported to move in a radial direction with respect to said main body to pick up a workpiece; and

driving means for driving said finger members to change their respective radial positions on said arm members, said driving means including a rotary member rotatably attached to said hand main body, driving force transmission means for transmitting a rotational force of said rotary member into a radial driving force for driving said finger members, with said rotary member including a driving gear having teeth formed on its outer periphery, wherein

said driving force transmission means includes idle gears rotatably attached to distal ends of said arm members, a toothed timing belt having teeth on an inner surface thereof which mesh with said idle gears and said driving gear, and regulating means for regulating a travel path of said toothed timing belt so it remains in meshed contact with said driving gear, and wherein

said finger members are coupled to said toothed timing belt and extend in the same direction from said respective arm members.

5,150,938

BAG GRIP

David L. Gans, 50 Laguna St., Apt. 308, San Francisco, Calif. 94102

Filed May 9, 1991, Ser. No. 697,572
Int. Cl.[5] B65D *33/06*
U.S. Cl. 294—156 6 Claims

1. Grip apparatus for a shopping bag of the type having two handles, including:

a bar having first and second ends;

a flexible cord having an attached end and a free end, the attached end of the cord affixed to the first end of the bar and the free end of the cord having a stop of fixed predetermined shape for releasably securing the free end of the cord to the second end of the bar;

a socket in the second end of the bar, into which socket the stop may be releasably secured, at least one portion of the shape of the socket being closely congruent to at least one portion of the shape of the stop, the socket leading to a transverse aperture in the second end of the bar for directing the free end of the cord out of the socket when the stop is secured in the socket; and

a slot in the second end of the bar communicating with the socket and the aperture, through which slot the cord may releasably travel,

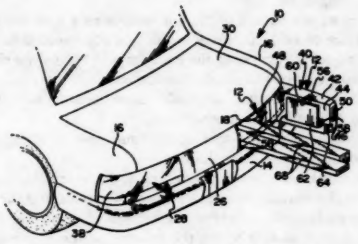
whereby the cord may fixedly engage the bag handles and the bar may be carried by grasping the bar.

5,150,939

SWING-OUT TAIL LAMP

Gerald L. Simin, Holly, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 10, 1992, Ser. No. 818,947
Int. Cl.[5] B60R *5/00*
U.S. Cl. 296—37.1 10 Claims



1. A tail lamp assembly for a vehicle having a trunk compartment,

said vehicle having parts thereof cooperating with said tail lamp assembly to define said trunk compartment,

said tail lamp assembly comprising a self-contained housing having a pair of laterally spaced end portions,

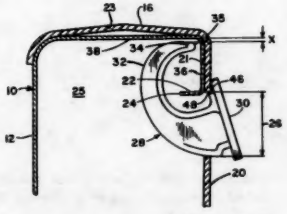
means connecting one of said end portions of said housing to said vehicle for allowing said housing to pivot outward from a closed position wherein said housing cooperates with said parts to define the trunk compartment and pivot to an open position wherein access is provided to said trunk compartment for the carrying of cargo that is longitudinally longer than said trunk compartment, and the other end of said portions having a lens mounted to therein so as to permit said tail lamp assembly to provide a stop light-turn signal warning to following vehicles when said tail lamp assembly is in said open position.

5,150,940

FASTENER FOR TRUCK BED LINER

John W. Kennedy, Spring Grove, Pa., assignor to York Products Inc., Hanover, Pa.

Filed Nov. 18, 1991, Ser. No. 793,626
Int. Cl.[5] B62D *33/02*
U.S. Cl. 296—39.2 10 Claims



1. In combination: a pick-up truck bed having a vertical outermost side which terminates into an upper rail having an upper horizontal portion and an inside vertical flange which forms an open side downwardly of the upper horizontal portion with the upper portion and flange having interior exposed walls, and a protective liner for at least the vertical side of the bed, the liner having an opening in an area below a lower end of the vertical flange and adjacent the open side of the rail, a fastener comprising:

a body member;

said body member havingan integral elongated extending section with a free end at the end thereof,

said extending section having a length sufficient to extend and pass through said opening of the liner with said free end extending within the open side of the rail,

a base plate at the end of said extending section opposite said free end,

said base plate having a perimeter portion larger than the opening in the liner,

said base plate having at the junction thereof with the upper surface of said extending section an edge engagable with an adjacent portion of the liner formed by the opening to create a pivot surface for the fastener,

said base plate having an inside recess located at its lower end generally opposite said edge,

said recess having a transverse dimension to receive the thickness of the liner therein,

the vertical distance of the opening in the liner being smaller than the distance between said pivot surface and the exterior surface of said extending section adjacent said recess to an extend that when the fastener is inserted into the opening said free end will be brought into contact with the interior wall of the flange, in a manner to cause said extending section to deflect by forcible contact with the interior wall of the flange and wherein said recess will be caused to snap over the liner to fasten the liner to the bed.

5,150,941

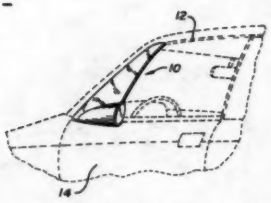
SIDE WINDOW AIR DEFLECTOR INCORPORATING A SIDE VIEW MIRROR

Elmar Silzer, Laguna Beach, and Emil Y. Leung, Monterery Park, both of Calif., assignors to Arvan, Inc., Gardena, Calif.

Filed Nov. 20, 1991, Ser. No. 795,027

Int. Cl.[5] B60J *1/20*

U.S. Cl. 296—152 **15 Claims**



1. A combined automobile deflector and side view mirror unit for attachment to a front edge of a window frame of an automobile door, comprising:

a mirror housing secured to the window frame and supporting a side view mirror; and

a shroud having an elongated portion having a leading edge attached to the entire periphery of the front edge of the window frame, the elongated portion extending outwardly in a curved fashion from the front edge thereof to define an open space between the door and the elongated portion, the elongated portion further having a curved portion at a lower end thereof for enclosing the mirror housing.

5,150,942

SAFETY MODULAR CAB SYSTEM FOR A LARGE, OFF ROAD-MACHINE

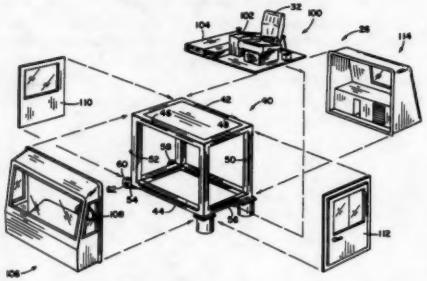
Steven J. Fujan, Sand Springs, and Frederick W. Loeber, Tulsa, both of Okla., assignors to Terex Corporation, Green Bay, Wis.

Division of Ser. No. 607,905, Nov. 1, 1990, Pat. No. 5,064,242. This application Apr. 8, 1991, Ser. No. 682,006

The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.

Int. Cl.[5] B62D *23/00*

U.S. Cl. 296—190 **15 Claims**



1. A safety modular cab system for a large, off-road machine having a frame and having a longitudinal axis in the direction of normal travel, and a front, the cab comprising:

a cab superstructure of generally rectangular box construction having a top, a front and an opposed back, a right side and an opposed left side, the superstructure having an interior and an exterior and having a bottom with an outer edge and an inner edge both of which are substantially parallel to the machine frame longitudinal axis;

closure means for enclosing said cab superstructure top, front, back, right side and left side, at least one of such closure means being modular so that it is attachable to and detachable from said cab supersturcture as a unit;

means of pivotally attaching one of said cab superstructure inner and outer bottom edges to the machine frame about an axis of pivotation substantially parallel to the machine frame longitudinal axis;

a lower plate having an opening therethrough;

a paralleled spaced apart upper plate having an opening therethrough, the upper plate being attached to a machine frame;

a crushable medium of selectable thickness between said lower and upper plate; and

a draw bolt received in said openings in said plates and through said crushable medium, one end of the bolt being in engagement with said lower plate and the other end in engagement with said cab superstructure.

5,150,943

VEHICLE WINDOW AND METHOD OF INSTALLING SAME

Peter Gold, 389 Peninsula Blvd., Hempstead, N.Y. 11550

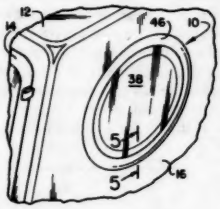
Filed Feb. 14, 1992, Ser. No. 835,529

Int. Cl.[5] B62D *27/02*; B60J *1/10*

U.S. Cl. 296—201 **3 Claims**

1. A wall-supported circular window for a van-type vehicle of the type having a wall and a circular-shaped window opening in said wall bounded by a peripheral edge, a mounting for said window comprising a U-shaped length in cross section of elastomeric construction material disposed in covering relation over said window opening peripheral edge along the entire circular shape thereof presenting inwardly and outwardly facing surfaces, a groove in said outwardly facing surface, an

adhesive strip disposed in said groove, a circular window having a peripheral edge defining said circular shape adhesively secured to said adhesive strip at a location inwardly of said peripheral edge so that the peripheral edge extending beyond said location of adhesive attachment bounds a compartment between said window peripheral edge and an underlying area of said vehicle wall, an elastomeric flexible lip connected to extend radially of said window peripheral edge, and solidifying adhesive deposited beneath said lip in said compartment, whereby said window is connected by said adhesive to said vehicle wall and the solidification thereof contributes to the rigidity of the vehicle wall area circumferentially about said window.

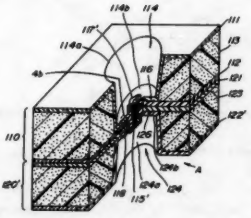


5,150,944

JOINT STRUCTURE FOR SANDWICHED STRUCTURAL BODY

Suguru Yoshida; Isao Tsunoda, and Shoichi Sano, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 446,429, Dec. 5, 1989, Pat. No. 5,060,975. This application Apr. 10, 1991, Ser. No. 683,536
Claims priority, application Japan, Apr. 11, 1990, 2-38868[U]; Apr. 23, 1990, 2-43255[U]
Int. Cl.[5] B62D *25/00, 29/04;* **E04C** *2/36, 2/52*
U.S. Cl. 296—203 **9 Claims**



8. A joint structure comprising:

a first sandwiched structural body including a pair of first and second outer skin layers enclosing a space therebetween;

a substantially concave joint region defined in said first outer skin layer and comprising a side wall and a bottom wall contiguous to said side wall, said bottom wall being joined to said second outer skin layer to define a mated region;

a second sandwiched structural body including a pair of first and second outer skin layers enclosing a space therebetween, said second sandwiched structural body being joined to said first sandwiched structural body at least said substantially concave joint region thereof; and

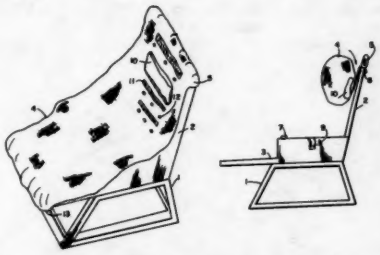
said first outer skin layer of said second sandwiched structural body being bonded to said mated region of said first sandwiched structural body by an adhesive.

5,150,945

VEHICULAR CHILD SEAT COVER

Patricia C. Aupperlee, 5961 St. Barbara St., West Palm Beach, Fla. 33415, and Beth R. Wiswell, 1702 12th Ct. N., Lake Worth, Fla. 33460

Filed Apr. 15, 1991, Ser. No. 684,783
Int. Cl.[5] A47C *7/62*
U.S. Cl. 297—184 **3 Claims**



1. A removable cover assembly for a vehicular child's seat of the type having a backrest with a top edge and a sitting portion with a bottom edge and an exterior surface provided for direct contact with a seated child, the cover assembly preventing soiling or overheating of the exterior surface of the child's seat when unoccupied and being removable with one hand for occupation by the child, said cover assembly comprising:

a) an elongate flexible panel having a head end, a lower end and an intermediate section therebetween, said panel dimensioned to cover the entire outer surface of the child's seat and accessories thereto, said lower end provided with a stretchable band for stretching over the bottom edge of the child's seat and said head end provided with engagement means for engaging the top edge of the child's seat;

b) a fabric pouch having a top margin, two sides, a broad outer face sheet and a broad under face sheet, said top margin having an opening therein extending substantially to said two sides, said opening providing access to a chamber defined by said two sides and the two said face sheets;

c) adjustable support means connected to the under face sheet of said pouch for supporting said pouch at adjustable distances below the top edge of the child's seat to rest beneath the head of a child of a particular size when seated on the seat;

d) said cover assembly provided with two modes of operation relative to the seat, a covered mode for use when the seat is unoccupied, in which the seat is completely covered from sun and soil by said panel with said head end engaging the top edge of the seat and the lower end engaging the bottom edge of the seat and the intermediate section covering the seat and accessories and an uncovered mode for use when the seat is to be occupied by a child, in which said lower end is disengaged from the bottom edge of the seat and stuffed into the chamber of said pouch together with the portion of the intermediate section of the panel that was below the level of the pouch in the covered mode, thereby exposing the clean and cool exterior surface of the seat for contact with the child and the stuffed pouch serving as a pillow at head level and as a storage means for a portion of the panel; and

e) said pouch and panel being arranged for changing between said two modes of operation with one hand, said lower end being readily released and engaged by said stretchable band and said head end having engagement means secure enough to remain engaged to the top edge of the seat while changing from one mode to another, said engagement means including a first member of a set of hook-and-loop fastening means affixed to said head end with a second member of said set of hook-and-loop fasten-

ing means arranged for attachment to the top of the backrest of a child's seat.

5,150,946

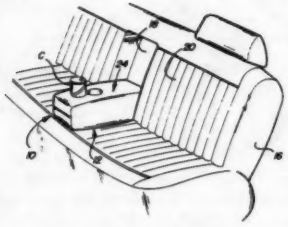
AUTOMOTIVE ARMREST WITH CUPHOLDER

Donald F. Marfilius, Farmington Hills, and Steven A. Schulte, Northville, both of Mich., assignors to Lear Seating Corporation, Southfield, Mich.

Continuation-in-part of Ser. No. 482,184, Feb. 20, 1990, abandoned. This application Oct. 3, 1990, Ser. No. 592,642

Int. Cl.[5] A47C *7/62*

U.S. Cl. 297—194 **7 Claims**



1. An armrest assembly for use in an automotive vehicle comprising:

a cellular foam cushion pad (**12, 112, 212**) presenting an upper armresting surface (**24, 124, 224**), a pliable cover extending over said upper surface (**24, 124, 224**),

receptacle means (**46, 146, 246**) disposed in said upper armresting surface (**24, 124, 224**) of said cushion pad (**12, 112, 212**) for receiving and supporting a beverage container (C),

characterized by said receptacle means (**46, 146, 246**) being fabricated of a pliable material forming a part of said cover so that said receptacle means (**46, 146, 246**) is soft and supple to the touch and readily yielding and distorted with said cover under the weight of a user's arm so as not to detract from the comfort of the armrest assembly but yet is resilient for regaining its receptacle shape upon removing the weight of the arm.

5,150,947

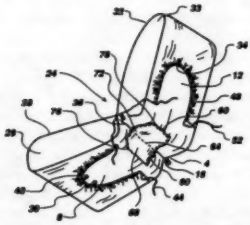
DUAL-TONGUE SEAT COVER ATTACHMENT

Steven P. Croshaw, Mendon, Utah, assignor to Saddleman, Inc., Logan, Utah

Filed Sep. 20, 1991, Ser. No. 763,221

Int. Cl.[5] A47C *31/00*

U.S. Cl. 297—229 **13 Claims**



1. A vehicle seat cover comprising

a seat cushion panel formed to fit over the seat cushion portion of a vehicle seat,

a seat back panel formed to fit over the seat back portion of a vehicle seat,

said seat cushion panel and seat back panel joined along a common transverse locus which lies adjacent the junction between the seat cushion portion and seat back portion of the vehicle seat when the cover is installed on the vehicle seat,

first and second flexible sheets jointed one above the other at respective contiguous forward edges to said common locus of the seat cushion panel and seat back panel to extend rearwardly thereof through the junction of the vehicle seat,

first means formed generally on a rear edge of the first sheet opposite the sheet's respective forward edge for coupling the first sheet to the seat cushion panel to secure the panel in place on the seat cushion portion of the vehicle seat, and

second means formed generally on a rear edge of the second sheet opposite the sheet's respective forward edge for coupling the second sheet to the seat back panel to secure the panel in place on the seat back portion of the vehicle seat.

5,150,948

RECLINING CHAIR

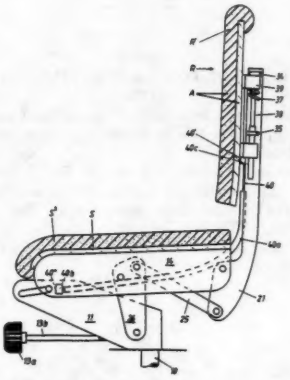
Rolf Völkle, Hohenholz 1, D-7298 Lossburg, Fed. Rep. of Germany

Filed Sep. 11, 1990, Ser. No. 580,461

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1989, 3930983

Int. Cl.[5] A47C *1/032*

U.S. Cl. 297—301 **11 Claims**



1. In a reclining chair comprising

a base structure including a vertically adjustable column,

a back rest,

a seat carrier supported by said column and having a forward end,

link means pivoted by a first pivot disposed in the front of said column to said seat carrier at the forward end thereof and by a second pivot disposed behind said column to said back rest,

a seat carried by said link means,

said chair being adapted to assume a position for work, in which said seat is approximately horizontal and includes an angle of about 90° with said back rest, a position for reclining, in which said seat is rearwardly inclined and includes an obtuse angle with said back rest, and a plurality of intermediate positions between said positions for work and for reclining,

locking means for locking said chair in any of said positions, and

spring means operatively connected to said back rest and said link means for urging said chair from said position for reclining to said position for work,

the improvement comprising shifting means connected to said back rest at a location spaced from said second pivot

and to said link means for imparting to said link means forward and rearward displacements, respectively, in response to a pivotal movement imparted to said back rest by said occupant to shift said chair from said position for work to said position for reclining and from said position for reclining to said position for work; said first pivot being carried by said link means and being mounted in said seat carrier in slide bearings for guiding said first pivot relative to said seat carrier during said forward and rearward displacements of said link means.

5,150,949

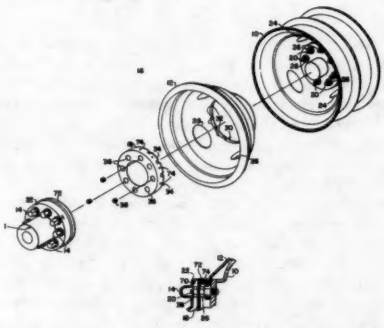
SIMULATED CUSTOM WHEELS

Mike Wang, 2049 W. 235th Pl., Torrance, Calif. 90501

Filed Mar. 5, 1991, Ser. No. 664,756

Int. Cl.[5] B60B *7/04, 7/06*

U.S. Cl. 301—37 S 5 Claims



1. A universal decorative wheel covering for use with automotive or truck wheels that can be inserted and removed without first removing the lug nuts holding the wheels to the drum of the vehicle comprising

a decorative wheel cover having a substantially concave shape and a circular central opening having a flanged rim;

a circular retaining ring having a flanged rim on the periphery adapted to mate with the flanged rim on said wheel cover for holding and supporting said wheel cover;

said retainer ring having a a plurality of openings of sufficient diameter to allow each stud to pass through but small enough to prevent the lug nuts from passing through, located against all of the lug nuts;

at least three nuts for securing said retaining ring to at least three studs for securing said ring against the lug nuts holding the wheel to the drum; and

a universal center hub having simulated lug nuts and lug covers, one for each stud whereby the wheel is covered by the cover and the lug nuts and studs are covered by the simulated lug nut covers;

said universal center hub having a flanged rim on the periphery adapted to mate with the flanged on said retainer ring whereby said ring supports and holds said hub and said cover.

5,150,950

ANTI-SKID BRAKE CONTROL METHOD

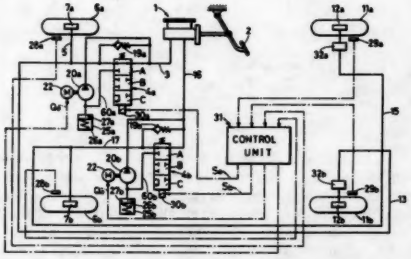
Tetsuro Arikawa, and Toshiyuki Abe, both of Yokohama, Japan, assignors to Nippon A B S Ltd., Kaigan, Japan

Filed Jul. 30, 1990, Ser. No. 559,331

Claims priority, application Japan, Jul. 31, 1989, 1-199012; Sep. 22, 1989, 1-246678

Int. Cl.[5] B60T *8/32*

U.S. Cl. 303—100 17 Claims



1. In a fluid-pressure control apparatus for an anti-skid braking control apparatus in a vehicle which includes:

(A) a pair of front wheels and a pair of rear wheels diagonally connected to said front wheels, respectively, in dual brake conduit systems;

(B) wheel speed sensors associated respectively with the front and rear wheels for detecting the rotational speeds of the respective wheels;

(C) a control unit for generating brake control signals corresponding to the rotational behaviors of the respective wheels and valve control signals on the basis of the outputs of said wheel speed sensors; and

(D) fluid pressure control valve means arranged in the respective brake conduit systems and operable by said valve control signals from said control unit;

an anti-skid brake control method in which brake control signals from said front wheels are used preferentially to brake control signals from said rear wheels as said valve control signals in the respective brake conduit system, comprising the steps of:

generating said brake control signal from any one of said wheels;

identifying the specific wheel from which said brake control signal is generated;

using said brake control signal as said valve control signal to operate said fluid pressure control valve means in the one brake conduit system to which said specific wheel belongs if said specific wheel is a front wheel of said vehicle and using said brake control signal as said valve control signal to operate said fluid pressure control valve means in the one brake conduit system to which said specific wheel belongs if a said specific wheel is a rear wheel of said vehicle and only if said vehicle is detected to be decelerating at a rate greater than a predetermined reference deceleration and, is further detected to be straight-running or, (b) the other rear wheel is detected to be slipping at a rate greater than a predetermined first reference slip.

5,150,951

HYDRAULIC DUAL-CIRCUIT BRAKE SYSTEM

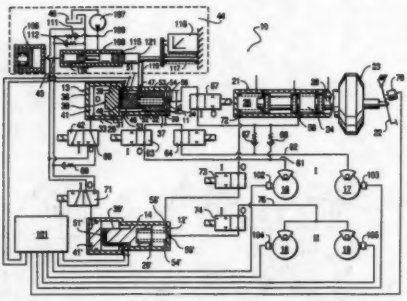
Heinz Leiber, Oberriexingen; Manfred Steiner, Winnenden, and Walter Klinkner, Stuttgart, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Dec. 17, 1990, Ser. No. 628,171

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1989, 3941408

Int. Cl.[5] B60T *8/34, 8/48, 13/12;* B60K *28/16*

U.S. Cl. 303—100 35 Claims



1. A hydraulic dual-circuit brake system for a road vehicle, with a division of a front-axle brake circuit and a rear-axle brake circuit, comprising a braking-pressure generator having two output pressure spaces, each allocated to one of the two brake circuits, in which static pressure is built up proportionally to an actuating force; and electro-hydraulic open-loop braking-pressure control device which, in at least one of closed-loop control phases of a closed-loop antiblocking and of a closed-loop drive slip control device with which the vehicle is also equipped, determines control of braking-pressure changing and braking-pressure holding phases, so as, in normal braking operation, to convey an adjustment of front-axle/rear-axle braking force distribution to an extent which at least approximately corresponds to an ideal braking force distribution both in a partial and in a full-braking range, the open-loop control device comprising sensors operatively arranged to generate electric output signals characteristic of the braking pressures and coupled into the brake circuits, an electronic open-loop control stage to which the output signals of the sensors are supplied as inputs to generate from a comparative processing of actual values, represented by the output signals of the sensors, of the braking force distribution with set points charcteristic of ideal braking force distribution, which are determined from vehicle-specific data in combination with data characteristic of ideal braking force distribution determined from vehicle-specific data in combination with data characteristic of at least one of an operating situation and a loading situation of the vehicle, electrical control signals required for driving the braking-pressure actuator, and a pressure modulator having an output pressure space movably delimited in a pressure-tight manner with respect to the drive pressure space by a piston and which is operatively connected to an associated brake circuit and also to an output pressure space of the braking-pressure generator, the output pressure space of the modulator being blocked off against the output pressure space of the braking-pressure generator with which the outlet pressure space of the braking-pressure actuator pressure modulator is associated in normal braking operation, and pressure build-up in one of the front-axle brake circuit and rear-axle brake circuit connected to the output pressure space of the pressure modulator is effected by valve-control pressure charging of the drive pressure space with output pressure of an auxiliary pressure source, the pressure build-up in the one brake circuit connected to the output pressure space of the pressure modulator being implemented by a servo control, for which a set point for the braking pressure in the brake circuit connected to the pressure modulator, correlated with the braking pressure in the other of the two brake circuits is an ideal value or approximately ideal value is utilized as a reference variable.

5,150,952

ANTI-SKID CONTROL SYSTEM FOR AN AUTOMOTIVE VEHICLE

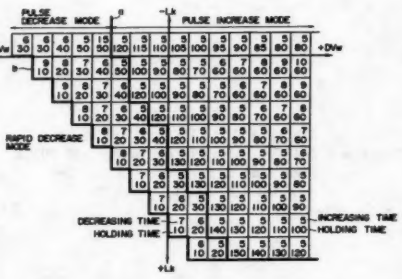
Kazutaka Kuwana, Toyota; Tsuyoshi Yoshida, Obu; Hiroyuki Ichikawa, Okazaki, and Kenji Tozu, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 15, 1990, Ser. No. 613,068

Claims priority, application Japan, Nov. 16, 1989, 1-298489

Int. Cl.[5] B60T *8/52*

U.S. Cl. 303—109 6 Claims



1. An anti-skid control system for an automotive vehicle having a wheel brake cylinder mounted on each of a plurality of road wheels for applying a braking force thereto and a master cylinder for supplying a hydraulic braking pressure to said wheel brake cylinder, comprising:

means for detecting wheel speed of each of said road wheels and providing an output signal corresponding to said wheel speed;

means for calculating an estimated vehicle speed for each of said plurality of road wheels on the basis of said wheel speed of each of said plurality of road wheels;

means for calculating a decreasing rate of said estimated vehicle speed of each of said plurality of road wheels;

means for modifying said estimated vehicle speed to provide a standard estimated vehicle speed for each of said plurality of road wheels in response to the decreasing rate of said estimated vehicle speed of at least one of said plurality of road wheels other than said estimated vehicle speed to be modified;

means for comparing said standard estimated vehicle speed and said wheel speed for each of said plurality of road wheels; and

pressure control means for increasing, holding or decreasing said hydraulic braking pressure in response to a comparison between said standard estimated vehicle speed and said wheel speed for each of said plurality of road wheels.

5,150,953

VIDEOTAPE STORAGE DEVICE

Edgar R. Benveniste, 336 Hillcrest Blvd., #419, Inglewood, Calif. 90301; Kenneth A. Tarlow, Santa Monica; Harold Goodman, Beverley Hills, both of Calif., and Gloria H. Benveniste, 101 Udine Way, Los Angeles, Calif. 90077, assignors to Edgar R. Benveniste and Gloria Benveniste, both of Los Angeles, Calif.

Filed Aug. 19, 1991, Ser. No. 747,005

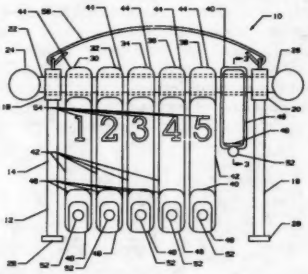
Int. Cl.[5] A47B *81/06*

U.S. Cl. 312—9.58 8 Claims

1. A videotape cassette storage device comprising:

A frame having a pair of spaced side legs and an upper cross-bar interconnecting said legs;

a plurality of videotape cassette containers, each of said containers being generally rectangular having a plurality of interconnected walls forming the same, each container having four corners and having an upper end and a lower end, and having an opening extending therethrough at the upper end thereof adjacent one of said corners, said cross-bar extending through said openings of said containers thereby pendulously supporting said containers on said



cross-bar, the configuration of said openings and the cross-section of said cross-bar allowing freely movable rotation of said containers on said cross-bar, at least some of said containers having contrasting indicia therein; and

a normally closed door portion at the lower end of each of said containers forming a lower wall on each of said containers and door opening and container lifting means associated with each of said lower walls for both lifting each of said containers and opening each of said door portions for removing videotape cassettes from each of said containers.

5,150,954

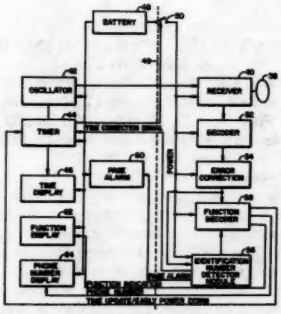
PAGER WATCH SYSTEM UTILIZING TIME SLOT COMMUNICATION

Don G. Hoff, Tiburon, Calif., assignor to Seiko Corp. and Seiko Epson Corp., Japan

Continuation of Ser. No. 336,645, Apr. 7, 1989, abandoned, which is a continuation of Ser. No. 49,045, May 11, 1987, abandoned, which is a continuation of Ser. No. 678,603, Dec. 5, 1984, abandoned. This application Sep. 12, 1990, Ser. No. 581,431

Int. Cl.[5] H04Q *1/00*

U.S. Cl. 340—825.44 **4 Claims**



1. A paging system for selectively communicating information to a plurality of receivers, comprising:

means for transmitting successive frames of information, each of said frames having substantially the same duration and being divided into a plurality of time slots, each time slot having a time reference point, selected time slots having an associated time slot number corresponding to the time reference point thereof,

a plurality of receivers for receiving said information, each of said receivers being associated with one of said selected time slots,

the time slot number of said selected time slots being transmitted during the associated time slot,

means for normally maintaining each of said receivers in an inactive power state and for periodically activating each of said receivers for an activation interval to receive information transmitted during the associated time slot, the periodicity of said activation interval corresponding to the occurrence of said associated time slot, each activation interval having a time reference point corresponding to initiation thereof,

means for interrogating the information received by a given receiver and for comparing the received time slot number with the time slot number associated with the given receiver, and

means in each of said receivers for changing the associated activation interval time reference point in response to comparison of the received time slot number with the time slot number associated with said receiver,

whereby a receiver can determine if it has been activated during its associated time slot and if not it can calculate the amount of change needed in its activation interval time reference point to cause said receiver to be activated during its associated time slot.

5,150,955

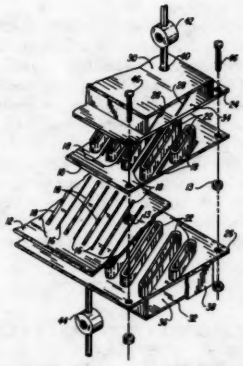
DRYING APPARATUS

Mark J. Devaney, Jr.; Lee F. Frank, boh of Rochester; Jeffrey L. Helfer, Webster; Haribhajan S. Kocher, Penfield, and Paul W. Wagner, Holley, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 633,495, Dec. 28, 1990, abandoned. This application Oct. 31, 1991, Ser. No. 785,899

Int. Cl.[5] G03D *3/08*

U.S. Cl. 354—321 **17 Claims**



1. Apparatus for subjecting a web to treatment fluid, said apparatus comprising:

means defining a fluid treatment channel for receiving the web, said means including a plurality of elongated juxtaposed fluid injection openings on opposite sides of said channel and a plurality of juxtaposed fluid evacuation openings on opposite sides of the channel, said fluid injection openings being angularly oriented with respect to the longitudinal axis of the web; and

means for supplying treatment fluid under pressure to said

injection openings to inject treatment fluid under pressure into said channel on opposite sides of the web to establish a flow of treatment fluid from said injection openings to said evacuation openings in directions having an angular relationship with the longitudinal axis of the web.

5,150,956

SAGNAC-TYPE FIBER-OPTIC GYROSCOPE WITH AUXILIARY FIBER COIL

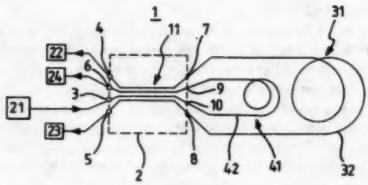
Wolfhardt Bähler, Munich; Hans Poisel, Dachau, and Gert Trommer, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Aug. 9, 1990, Ser. No. 564,751

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1989, 3926312

Int. Cl.[5] G01C *19/72*

U.S. Cl. 356—350 **5 Claims**



1. A fiber optic gyroscope comprising:

a light source emitting continuous light having a wide-band frequency range;

a main fiber coil comprising an optical fiber having two ends;

at least one auxiliary fiber coil comprising an optical fiber having two ends and having a length and radius the product of which is smaller than that of the main fiber coil;

said light source being optically coupled to said main fiber coil and said auxiliary fiber coil by a 4×4 directional coupler whereby light from said light source is fed into both ends of the optical fibers and is transmitted in mutually opposite directions in each of the respective main and auxiliary fiber coils;

means for combining light emitted from the ends of the fiber in said main coil to generate a first interference signal which is responsive to a speed of rotation of said gyroscope, and for combining the light emitted from the ends of the fiber in the auxiliary coil to generate a second interference signal which is responsive to a speed of rotation of said gyroscope;

means for combining said first and second interference signals to produce a third interference signal which is equal to the sum of the first and second interference signals;

and light detector means coupled to at least two gates of said 4×4 coupler means for detecting said third interference signal.

5,150,957

REAL TIME REGISTRATION WEAVE CORRECTION SYSTEM

David L. Walker, 731 Puma Canyon La., Glendora, Calif. 91740, and Steven A. Spears, 1569 Calle Ciervos, San Dimas, Calif. 91773

Filed Mar. 30, 1990, Ser. No. 502,472

Claims priority, application United Kingdom, Oct. 20, 1989, 8923654.1

Int. Cl.[5] H04N *3/36*

U.S. Cl. 358—347 **17 Claims**

1. A digital weave correction system operable to correct film weave in the transfer of film to video and video to film, comprising:

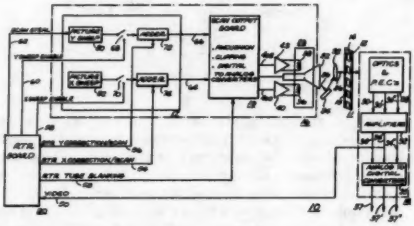
a light beam generating means operable to produce a light beam;

a reflective means operable to reflect said light beam received from said light beam generation means;

a focusing means operable to receive said reflected light beam from said reflective means and further operable to focus said reflected light beam to a position on a piece of multi-framed, sprocketed film stock;

an optical detection means positioned behind said multi-framed sprocketed film stock, operable to detect the changing intensity of said light beam as it passes through said multi-framed sprocketed film stock, further said optical detection means operable to produce a video signal when said focused light beam crosses an interior edge of a sprocket hole in said multi-framed, sprocketed film stock;

a real time registration means said real time registration means operable to receive said detected video signal from said optical detector means, and said real time registration



means operable to generate a vertical and a horizontal correction signal;

a scan generator means, said scan generator means operable to generate a normal vertical scanning signal and a normal horizontal scanning signal, said scan generator further operable to receive said vertical and said horizontal correction signal from said real time registration means, said scan generator means further operable to combine said normal vertical scan signal with said vertical correction signal and combine said normal horizontal scan signal with said horizontal correction signal; and

a light beam deflection assembly means said light beam deflection assembly means surrounding said light beam generation means, said light beam deflection assembly means operable to receive said combined vertical scan/correction signal and said combined horizontal scan/correction signal, said light beam deflection assembly means being further operable to deflect said light beam in the horizontal and the vertical directions.

5,150,958

VEHICULAR HEADLAMP HAVING INCLINATION MEASURING UNIT

Kenji Miyazawa, and Hidetoshi Terao, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 798,953

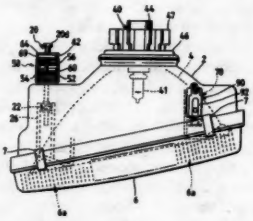
Claims priority, application Japan, Nov. 29, 1990, 2-325361

Int. Cl.[5] F21M *3/20*

U.S. Cl. 362—66 **20 Claims**

1. In a vehicular headlamp of a movable inclination member type in which an inclination member with a light reflecting surface for setting the direction of irradiation of said lamp is supported at three points of a swinging fulcrum supported on a reference member, and a horizontal aiming screw and a vertical aiming screw which penetrate said reference member and extend in directions generally parallel to an optical axis of said headlamp are supported by said reference member, said horizontal and vertical aiming screws being turned to adjust an inclination of said inclination member in a horizontal plane and in a vertical plane, respectively, to adjust the angle of irradiation of said headlamp, and an inclination measuring unit is

provided to measure an angle of inclination of said movable inclination member, the improvement wherein said inclination measuring unit is interposed between said reference member and a rear end portion of at least one of said aiming screws which protrudes rearward from said reference member, said inclination measuring unit determining said angle of inclination of said movable member by an amount of rotation of said at



least one of said aiming screws following a zero-point adjustment of said inclination measuring unit, said inclination measuring unit comprising a base member engaged with said rear end portion of said at least one of said aiming screws to be rotated by said screw, said base member having a male thread on an outer surface thereof, and a slide member threadably engaged with said male thread on said base member.

5,150,959

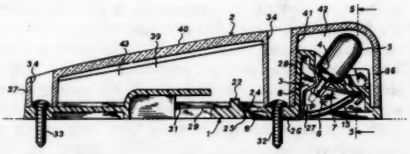
COMBINATION SIDE MARKER, CLEARANCE AND REFLEX LAMP FOR A VEHICLE

Edgar C. Paffrath, Barrington, Ill., and Brian A. Hanson, Theresa, Wis., assignors to Wesbar Corporation, West Bend, Wis.

Filed Feb. 6, 1991, Ser. No. 651,536

Int. Cl.[5] B60Q *1/26*

U.S. Cl. 362—80 **25 Claims**



1. A combination side marker, clearance and reflex lamp for a vehicle, comprising a base, connecting means for connecting the base to a vehicle, an outer surface of said base having an inwardly extending portion defining a recess, a lens mounted on the base and defining in combination with said base a bulb compartment, the inwardly extending portion of the base having an opening connecting the bulb compartment and the recess, a bulb disposed in the bulb compartment and having an electrically conductive base portion, said base portion extending through said opening and into said recess, sealing means for hermetically sealing said bulb compartment, and a plurality of electrical conductors mounted on the base and extending into said recess and connected to said bulb base portion.

5,150,960

REAR LICENSE PLATE ILLUMINATION

Morris R. Redick, Waterford, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 6, 1991, Ser. No. 802,801

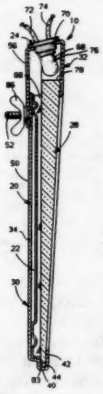
Int. Cl.[5] B60Q *1/56*

U.S. Cl. 362—83.2 **9 Claims**

1. A vehicle illumination device for a license plate comprising:

a frame for supporting the license plate in a substantially vertical position wherein said frame comprises a two-piece structure and includes means permit a separation of said pieces so as to allow replacement of the vehicle plate;

a light pipe made of a solid clear material located within said frame in front of said license plate, and



a light source along one edge of said light pipe whereby said light pipe serves to uniformly illuminate said vehicle license plate when said light source is energized.

5,150,961

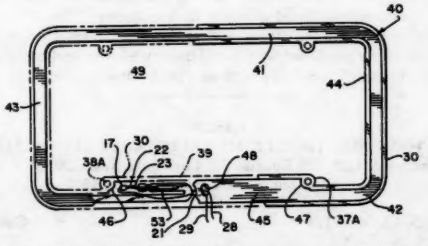
APPARATUS FOR ILLUMINATING A VEHICLE LICENSE PLATE AND METHOD OF USING SAME

Jaime D. Gonzalez, 9390 Suva St., Downey, Calif. 90240

Filed Aug. 6, 1991, Ser. No. 741,784

Int. Cl.[5] B60Q *1/56*

U.S. Cl. 362—83.2 **8 Claims**



1. A method of using an illuminating apparatus for illuminating a rear portion of a vehicle, comprising:

mounting a license plate to tube holder means;

placing a neon tube in said tube holder means;

connecting a set of conductors to electrodes of said neon tube;

connecting a free end of said conductors to a high frequency, high voltage transformer;

mounting said transformer adjacent to said neon tube in said tube holder means;

passing a set of input conductors attached to said transformer through an aperture disposed within a cover plate;

engaging said tube holder means with said cover plate to seal the neon tube and high voltage transformer within said tube holder;

coupling said input conductors to means for coupling said neon tube to an electrical system of the vehicle; and

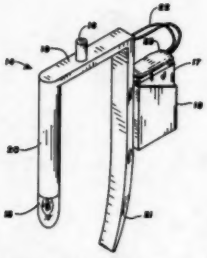
mounting said tube holder means and said cover plate to the rear portion of the vehicle.

5,150,962

TOILET BOWL ILLUMINATING DEVICE

Michael Rauschenberger, 1938 Misty Dr., Benton, Ark. 72015

Filed Feb. 10, 1992, Ser. No. 833,064
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—101 1 Claim



1. A toilet bowl illuminating device comprising:

a body, comprising

an essentially flat horizontal segment having an interior end, an exterior end and an upper surface,

an interior segment depending downwardly from said interior end of said horizontal segment such that said interior segment extends into the interior of the toilet bowl when said horizontal segment is positioned on the upper rim of the toilet bowl, and

an exterior segment extending downwardly and inwardly from said exterior end of said horizontal segment, said exterior segment further being comprised of a flexible material such that said exterior segment engages the exterior upper rim of the toilet bowl in a releasably clamping manner,

said interior segment further having a lower end;

a lamp mounted on said lower end of said interior segment;

a momentary, normally-closed, push-button switch mounted on said upper surface of said horizontal segment and communicating electrically with said lamp;

a battery housing mounted to said exterior segment; and

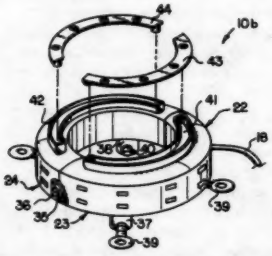
a battery contained within said battery housing and communicating electrically with said push-button switch.

5,150,963

CHRISTMAS TREE LIGHT RECEPTACLE APPARATUS

Shirley J. Hill, 830 Douglas St., Covington, Tenn. 38019

Filed Jan. 6, 1992, Ser. No. 817,343
Int. Cl.[5] F21V *23/00*
U.S. Cl. 362—123 1 Claim



1. A Christmas tree light receptacle apparatus, comprising,

a torroidal ring housing, the torroidal ring housing including a central axial bore directed coaxially therethrough arranged to receive a Christmas tree through the axial bore, and

the torroidal ring housing further including a cylindrical outer wall concentric with an inner wall, and

the cylindrical outer wall including a plurality of electrical receptacles directed into the housing from the outer wall, and

an electrical supply line directed into the housing in electrical communication with each receptacle, and

the ring housing includes a first semicylindrical housing and a second semi-cylindrical housing, with the first semi-cylindrical housing including a first housing first end wall and a first housing second end wall in coplanar relationship, the second semi-cylindrical housing including a second housing first end wall and a second housing second end wall arranged in a coplanar relationship, the first housing first end wall includes a first housing first end wall receptacle, and the first housing second end wall including a first housing second end wall plug, the second housing first end wall including a second housing first end wall plug and the second housing second wall including a second housing second end wall receptacle, the first housing first end wall receptacle received within the second housing first end wall plug, and the first housing second end wall plug received within the second housing second end wall plug received within the second housing second end wall receptacle to effect electrical communication of the first semi-cylindrical housing with the second semi-cylindrical housing and the electrical supply line, and

the first housing includes a first housing deflectable latch flange, including a first bore directed therethrough, wherein the first housing deflectable latch flange is tangentially aligned relative to the first housing extending orthogonally beyond the first housing first end wall, and the second housing including a second housing first end wall, and the second housing including a second housing boss plug positioned to the cylindrical outer wall adjacent the second housing first end wall, wherein the second housing boss plug is received within the first bore, and the first housing including a first housing boss plug mounted to the outer wall of the ring housing positioned adjacent the first housing second end wall, and the second housing including a second housing latch flange with a second bore directed therethrough positioned adjacent and orthogonally extending beyond the second housing second end wall tangentially mounted to the cylindrical outer wall to receive the first housing boss plug within the second bore, and

the first semi-cylindrical housing includes a plurality of first boss members mounted to a bottom surface of the first housing, and the second housing including a plurality of second boss members mounted to a bottom wall of the second housing, with the first boss members each receiving a threaded first rod directed therethrough, wherein each threaded first rod is radially aligned relative to the threaded second rods are radially aligned relative to the axial bore positioned therebelow, and

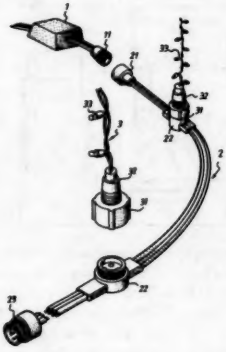
the first housing includes a first housing top wall and the first housing top wall includes a first trough mounted thereon, and the second housing includes a second housing top wall, and the second housing top wall includes a second trough mounted thereon, and the first trough and the second trough mounted thereon, and the first trough and the second trough are arranged for reception of fluid and potpourri therewithin, and the first trough includes a first aperture plate mounted to an upper distal end of the first trough, and the second aperture plate is arranged for securement to an upper distal end of the second trough, wherein the first aperture plate and the second aperture plate meter fragrance directed through the respective first and second apertured plate from the respective first and second trough.

5,150,964

JOY LIGHT STRUCTURE

Pui-Hing Tsui, Room 1505, 15/F., Fullagar Industrial Building, 234 Aberdeen Main Road, Aberdeen, Hong Kong, Hong Kong

Filed Jun. 21, 1991, Ser. No. 719,029
Int. Cl.[5] F21V *23/04;* F21P *1/02*
U.S. Cl. 362—251 8 Claims



1. A joy light structure for variable connecting manner comprising:

(a) a controller (1) for providing an adjustable flashing module frequency signal and a plurality of channels;

(b) at least a main connecting wire (2) having a controller socket (21) at one end thereof for connecting of said main connecting wire (2) to the controller (1), a connecting plug (23) mounted at another end thereof for connecting of said main connecting wire (2) to a further main connecting wire, and at least a socket (22) being provided along said main connecting wire (2); and

(c) at least a string light (3) having a plurality of bulbs connected in series and a plug (32) disposed at one end thereof for connecting of the string light (3) to said main connecting wire (2) by inserting the plug (32) into the socket (22) and screwing a fastener (31) of said plug (32) onto said socket (22) the improvement comprising:

said main connecting wire (2) having at least three conductive wires, one being a common wire (221) and the others being controlled wires (222, 223);

at least three holes being provided within said socket (22), one for said common wire (221) and the others for said controlled wires (222, 223);

said plug (32) having two terminals, one terminal (321) for said common wire (221) and another terminal (322) for one of said controlled wires (222, 223);

a water-proof ring (323) being disposed between said plug (32) and socket (22) to prevent moisture permeation when said fastener (31) is screwed tight, whereby said string light (3) flashes in accordance with a flashing module controlled by said controller (1).

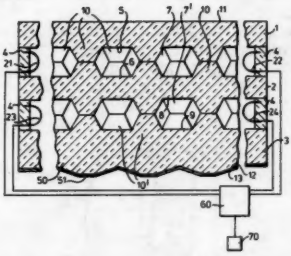
5,150,965

RADIATION-EMITTING PANELS AND DISPLAY ASSEMBLIES

Neil A. Fox, Eversham, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Jul. 5, 1991, Ser. No. 726,176
Claims priority, application United Kingdom, Jul. 16, 1990, 9015575
Int. Cl.[5] F21K *7/00*
U.S. Cl. 362—260 10 Claims

1. A radiation-emitting panel of the kind including a first upper plate transparent to visible radiation, a second plate sealed with the first plate around its edge and enclosing a first gas-discharge volume at reduced pressure between a lower surface of the first plate and an upper surface of the second plate, at least one support member supporting the first and second plates within their edges internally of the first gas-discharge volume, and electrodes operable to excite discharge and radiation within said gas-discharge volume, the improvement wherein the panel includes a third lower plate, means sealing the third plate with the second plate around its edge and enclosing a second gas-discharge volume at reduced pressure between the lower surface of the second plate and the



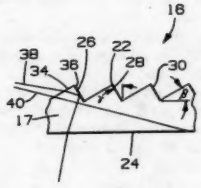
upper surface of the third plate, at least one support member supporting the second and third plates within their edges internally of the second gas-discharge volume, and electrodes operable to excite discharge and radiation within the second gas-discharge volume, and wherein the second plate is transparent to visible radiation such that a part at least of the radiation produced in the second gas-discharge volume is transmitted through the second and first plates such that illumination can be provided by the panel even when there is no discharge within the first gas-discharge volume.

5,150,966

UNIFORM INTENSITY PROFILE CATADIOPTRIC LENS

John C. Nelson, The Sea Ranch, Calif., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Sep. 19, 1990, Ser. No. 585,308
Int. Cl.[5] F21V *5/02*
U.S. Cl. 362—337 12 Claims



1. A light fixture comprising:

a housing defining an optical cavity having an optical window for allowing light to escape from said optical cavity;

a light source in said optical cavity for producing light; and

a lens lying in said optical window for directing light from said optical cavity through said optical window, said lens having a first surface external to said optical cavity and a second surface internal to said optical cavity, said second surface being a structured surface, said structured surface having a plurality of triangular prisms formed thereon, each said prisms having a transmissive facet and a reflective facet positioned such that light from said light source will enter said lens through one of said transmissive facets, be totally internally reflected by one of said reflective facets and exit through said first surface, where each of said transmissive facets makes a first angle with said optical window and each of said reflective facets makes a second angle with a normal to said optical window, said

first and second angles for each of said prisms being selected to provide preselected light intensity distribution over said optical windown, said preselected light intensity distribution being provided by discarding a preselected percentage of said light from said light source.

5,150,967

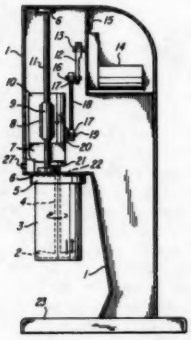
MILKSHAKE MACHINE

Jim L. Neilson IV, 1021 Santa Cruz Way, Rohnert Park 94928, and Demont Neilson, Grassvalley, both of Calif., assignors to Jim L. Neilson, Elk Grove and Josefa N. Neilson, San Diego, both of Calif.

Continuation of Ser. No. 220,584, Jul. 18, 1988, abandoned. This application Oct. 25, 1991, Ser. No. 784,631

Int. Cl.[5] B01F *7/00, 7/16*

U.S. Cl. 366—206 **9 Claims**



1. An apparatus for blending ingredients comprising:

a) a housing;

b) a pair of mutually spaced vertical guide rods fixed in said housing;

c) a first motor slidably mounted on said guide rods by slider bearings such that said first motor may freely move up and down along said guide rods;

d) a mixing shaft including a mixing head drivingly connected to said first motor and movable up and down with said first motor;

e) a second motor operable simultaneously with said first motor mounted to said housing, said second motor including a drive shaft; and

f) means coupling said drive shaft of said second motor to said first motor such that rotation of said second motor drive shaft causes said first motor to slide up and down on said guide rods while said mixing shaft is rotatably driven by said first motor.

5,150,968

PLANETARY MIXER

Masakazu Inoue, Isehara, Japan, assignor to Inoue Seisakusho (Mfg) Co., Ltd., Japan

Filed Feb. 19, 1991, Ser. No. 657,421

Int. Cl.[5] B01F *7/14*

U.S. Cl. 366—288 **15 Claims**

1. A planetary mixer comprising:

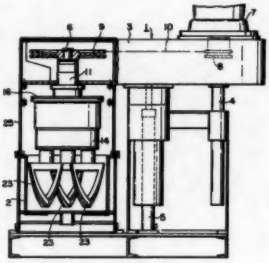
an agitating head located above a tank;

a rotationally driven drive shaft downwardly extending from said head;

a rotary body connected to said drive shaft to rotate therewith;

three driven shafts rotatably carried by said rotary body and located at positions corresponding to respective apexes of an imaginary equilateral triangle surrounding said drive shaft;

three agitating blades connected to respective ones of said driven shafts and extending widthwise thereof, each blade having a maximum widthwise extent longer than the distance between the apexes of the imaginary equilateral triangle and long enough to allow said blade to rotate in close proximity to the inner wall of said tank; and



means responsive to rotation of said rotary body for rotating said driven shafts on their respective axes and revolving said driven shafts around said drive shaft thereby causing said three blades to undergo planetary motion in close proximity to the inner wall of said tank.

5,150,969

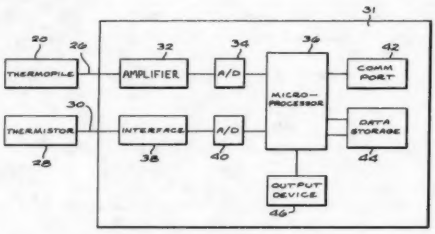
SYSTEM AND METHOD FOR TEMPERATURE DETERMINATION AND CALIBRATION IN A BIOMEDICAL PROBE

Jack Goldberg, San Diego, and Robert J. Rosati, Carlsbad, both of Calif., assignors to IVAC Corporation, San Diego, Calif.

Continuation of Ser. No. 492,655, Mar. 12, 1990, abandoned. This application Jul. 10, 1991, Ser. No. 729,866

Int. Cl.[5] G01J *5/18;* **A61B** *5/00*

U.S. Cl. 374—128 **28 Claims**



1. A thermometry system for providing a temperature signal representative of the temperature of a first target derived from the infrared energy received from the first target, comprising:

detector means having an infrared sensing area for receiving the infrared radiation from the first target and having a reference temperature area, the detector means providing a steady state detector signal which is a function of the temperature of the infrared sensing area and of the reference temperature area;

sensor means for providing a reference signal which is a function of the temperature of the reference temperature area;

processor means for providing a first polynomial function of the detector signal having a plurality of non-zero terms, for providing a second polynomial function of the reference signal having a plurality of non-zero terms, for combining the first polynomial function with the second polynomial function and for providing the temperature signal based on said combination.

5,150,970

OPEN MESH CARRYING BAG AND METHOD OF MAKING

Joseph M. Albarelli, 17 Denise Dr., Kinnelon, N.J. 07405

Filed Sep. 23, 1991, Ser. No. 763,553
Int. Cl.[5] B65D *30/06, 33/28*
U.S. Cl. 383—76 **10 Claims**

1. In a carrying bag for articles of maximum predetermined dimensions, the carrying bag including:

at least one side wall constructed of an open mesh material having mesh openings, the mesh openings all having dimensions in every direction smaller than the maximum predetermined dimensions of the articles to be carried, the side wall extending from a bottom end to a top end;

bottom closure means; and

top closure means for selectively closing the bag at the top end of the side wall;

an improvement in the top closure means, the improvement comprising:

a hem at the top end of the side wall, the hem including a folded-over portion of the side wall folded back toward the bottom end so as to overlap a further portion of the side wall adjacent the top end and register at least some of the mesh openings in the folded-over portion of the side wall with counterpart mesh openings in the overlapped further portion of the side wall; and

a drawstring threaded through at least some of the registered mesh openings such that the drawstring passes through both the folded-over portion and the overlapped further portion of the side wall to secure together the folded-over portion and the overlapped further portion of the side wall without the necessity for additional securing means and provide a carrying handle while enabling selective contraction and closing of the top end of the bag by drawing upon the drawstring.

5,150,971

DIAGNOSTIC SPECIMEN MAILING DEVICE

Kathleen M. Strong, Sunnyvale, and Richard S. Matusewicz, San Jose, both of, assignors to Beckman Instruments, Inc., Fullerton, Calif.

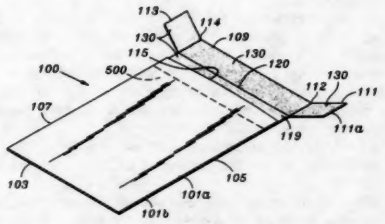
Continuation of Ser. No. 622,677, Dec. 7, 1990, abandoned. This application Dec. 23, 1991, Ser. No. 813,065
Int. Cl.[5] B65D *30/08, 33/18*
U.S. Cl. 383—84 **10 Claims**

1. A mailing device useful for etiologic agents and biomedical materials comprising:

a) a substantially rectangular front panel and a substantially rectangular back panel where three sides of said front panel and three sides of said back panel are in sealed communication with each other, said sealed sides being impervious to liquids, and where a fourth side of said front panel and a fourth side of said back panel define an opening to an interior central region between said front panel and said back panel, said front panel and said back panel each comprising at least two layers, a first outer layer and a second interior layer, said second interior layer being exposed to said interior central region, said second interior layer being impervious to liquids, said second interior layer being chemically inert to etiologic agents and biomedical materials, the side of said back panel not in sealed communication with the side of said front panel further comprising a flap region, said flap region defining a first length, said flap region comprising:

i) adhesive means for sealing said flap region to said front panel;

ii) means for folding said flap region, said means being located along a line substantially parallel to said opening to said interior central region, said line being from about one-fourth to about one-half of the length of said flap region from said opening to said interior central region; and



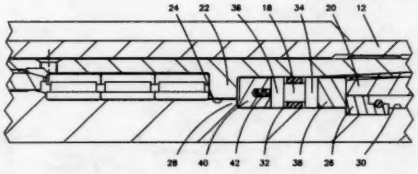
iii) at least two tabs, a first tab extending outwardly from said flap region in a direction parallel to the opening of said interior central region, and a second tab extending outwardly from said flap region in a direction parallel to the opening of said interior central region, said first tab and said second tab being on opposite ends of said flap region relative to each other, said first tab and said second tab each including means for folding said tabs, said first tab and said second tab each including adhesive means for sealing said tabs to said back panel.

5,150,972

METHOD OF INCREASING THE OFF BOTTOM LOAD CAPACITY OF A BEARING ASSEMBLY

William R. Wenzel, 3763 - 74 Avenue, Edmonton, Alberta, Canada T6B 2T7

Filed Sep. 26, 1991, Ser. No. 766,016
Claims priority, application Canada, Oct. 1, 1990, 2026630
Int. Cl.[5] E21B *4/00;* **F16C** *19/30;* **B21D** *53/10*
U.S. Cl. 384—97 **3 Claims**



1. A method of increasing the off bottom load capacity of a bearing assembly having an outer tubular member, an inner tubular member telescopically received within the outer tubular member, and bearings disposed between the inner tubular member and outer tubular member to facilitate relative rotation of the outer tubular member and inner tubular member while accommodating radial and axial loads, comprising the steps of:

a) firstly, forming a first shoulder and a second shoulder in opposed spaced relation on an interior surface of the outer tubular member;

b) secondly, forming a first shoulder and a second shoulder in opposed spaced relation on an exterior surface of the

inner tubular member, the shoulders on the inner tubular member being generally aligned with the shoulders on the outer tubular member thereby defining a containment chamber; and

c) thirdly, placing at least one thrust bearing in the containment chamber, the thrust bearing having a first side race and a second side race, such that when the bearing assembly is placed in compression the first shoulder of the outer tubular member bears against the first side race and the second shoulder of the inner tubular member bears against the second side race, and when the bearing assembly is placed in tension the second shoulder of the outer tubular member bears against the second side race and the first shoulder of the inner tubular member bears against the first side race.

2. An improvement in a bearing assembly having an outer tubular member, an inner tubular member telescopically received within the outer tubular member, and bearings disposed between the inner tubular member and outer tubular member to facilitate relative rotation of the outer tubular member and inner tubular member while bearing radial and axial loads, the improvement comprising:

a) a first shoulder and a second shoulder in opposed spaced relation on an interior surface of the outer tubular member;

b) a first shoulder and a second shoulder in opposed spaced relation on an exterior surface of the inner tubular member, the shoulders on the inner tubular member being generally parallel to the shoulders on the outer tubular member thereby defining a containment chamber; and

c) at least one thrust bearing disposed in the containment chamber, the thrust bearing having a first side race and a second side race, such that when the bearing assembly in placed in compression the first shoulder of the outer tubular member bears against the first side race and the second shoulder of the inner tubular member bears against the second side race, and when the bearing assembly is placed in tension the second shoulder of the outer tubular member bears against the second side race and the first shoulder of the inner tubular member bears against the first side race.

5,150,973

MOUNTING SLEEVE FOR ANTI-FRICTION BEARING

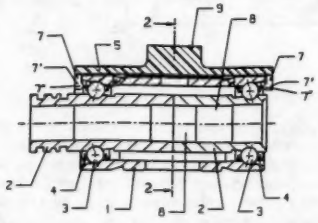
Ernst Masur, Untereuerheim; Gottfried Ruoff, Oberwerrn, and Werner Planek, Dittelbrunn, all of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer KgaA, Fed. Rep. of Germany

Filed Dec. 16, 1991, Ser. No. 809,266

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1991, 9100928[U]

Int. Cl.[5] F16C *41/04, 33/60, 43/04*

U.S. Cl. 384—448 **16 Claims**



1. A mounting sleeve for an anti-friction bearing, the bearing having an outer ring, an inner ring and at least one annular row of anti-friction rolling bodies between the rings;

the mounting sleeve being of approximately U-shaped cross-section with a slit opening extending along the axial length of the sleeve and the slit opening defining arms of and circumferential ends of the sleeve, the width of the opening between the ends of the arm being sufficient to enable the sleeve to be installed, slit opening first, over the outer ring and to enable the sleeve to be removed from the outer ring with the outer ring passing through the slit opening;

the row of rolling bodies being toward one axial end of the inner and the outer rings;

a flange extending at least partially around the sleeve, located at the one axial end of the sleeve and extending radially inward to at least indirectly engage the row of rolling bodies to help prevent the rolling bodies in the row from moving axially out from the outer ring.

5,150,974

GREASE-SEALED BEARING WITH OXIDE LAYERS

Kenji Tamada, Kuwana; Hirokazu Nakajima, Kaizu; Akio Okayama, and Takahiro Mizutani, both of Kuwana, all of Japan, assignors to NTN Corporation, Osaka, Japan

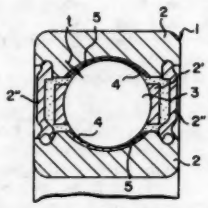
PCT No. PCT/JP90/00031, § 371 Date Sep. 10, 1990, § 102(e) Date Sep. 10, 1990, PCT Pub. No. WO90/08264, PCT Pub. Date Jul. 26, 1990

PCT Filed Jan. 12, 1990, Ser. No. 576,498

Claims priority, application Japan, Jan. 14, 1989, 1-6557

Int. Cl.[5] F16C *33/10, 33/62*

U.S. Cl. 384—463 **2 Claims**



1. A grease-sealed bearing having inner and outer rings that enclose a plurality of rolling elements, a cage for guiding the plurality of rolling elements, seal members for sealing said plurality of rolling elements enclosed between said inner and outer rings, and grease sealed therebetween, characterized in that oxide coatings having a thickness of 0.1–2.5 microns are formed on rolling surfaces of the rings.

5,150,975

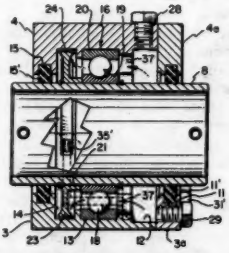
COMPACT SELF-LUBRICATING BEARING SYSTEM

Kenneth E. Major; John L. Baker, and David K. Braunagel, all of Houston, Tex., assignors to Hy-Tech Hydraulics, Inc. and Michael P. Breston, both of Houston, Tex.

Filed Feb. 12, 1987, Ser. No. 14,425

Int. Cl.[5] F16C *33/66*

U.S. Cl. 384—465 **18 Claims**



1. A bearing lubricating system, comprising:

a casing having a body defining a bore, a liquid lubricant

reservoir, a circular well, and a return passage between said well and said reservoir;

said well having at least one expanding channel gradually tapering outwardly over an arcuate extent;

said channel having a discharge outlet communicating with said return passage;

a shaft extending through said reservoir and through said well;

at least one bearing between said reservoir and said well, said bearing having an inner race, an outer race, and bearing elements between said races for supporting said shaft for rotation within said bore;

a circular pumping mechanism concentrically mounted on said shaft for rotation within said well, said pumping mechanism having (1) an overall diameter corresponding substantially to the outside diameter of said outer race, and (2) at least two diametrically-opposed radial vanes, and each consecutive pair of vanes defining a pocket therebetween for accepting lubricant therein, whereby said pumping mechanism, when rotating with said shaft, (1) causing lubricant to flow by suction out of said reservoir through and across said bearing and into said well, thereby lubricating and cleansing said bearing elements, and (2) pressurizing said lubricant to flow out of said well and return to said reservoir through said discharge outlet and said return passage; and

a pair of end seals at the opposite ends of said bore for sealing off said bore from the ambient.

5,150,976

MATRIX PRINTING HEAD WITH FORWARD AND RETURN ARTICULATED-ARMATURE MAGNETS

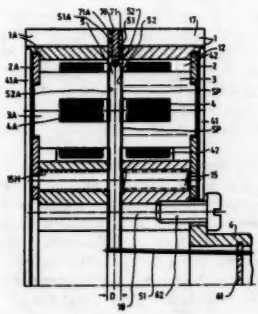
Jurgen Hilkenmeier, Paderborn, and Hans-Werner Volke, Salzkotten, both of Fed. Rep. of Germany, assignors to Siemens-Nixdorf Informationssysteme AG, Paderborn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 272,680, Nov. 7, 1988, Pat. No. 4,988,223. This application Nov. 19, 1990, Ser. No. 615,197

Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715304; PCT Int'l Appl., May 7, 1988, EP88/00393

Int. Cl.[5] B41J *2/27*

U.S. Cl. 400—124 **3 Claims**



1. An electromagnetic drive mechanism for a matrix printing head pin, comprising: an articulated armature mounted for articulation at one end and having a free end for acting on a matrix printing head pin and having a longitudinal midplane; and forward mechanism for articulating the armature to move a pin into an engaged position comprising a first electromagnet with an exciter winding and a first yoke on one side of the armature having a pole surface; a return mechanism for articulating the armature to move a pin into a disengaged position, wherein the return mechanism comprises a second electromagnet acting upon the same armature as that of the first electromagnet and with an exciter winding and a second yoke identical to the first yoke and having a pole surface and mounted on a side of the armature facing away form the first yoke of the first electromagnet with the pole surfaces facing each other and wherein the first and second electromagnets are mirror symmetrical about the longitudinal midplane of the armature; and controls to alternate the flow of current through the exciter windings of the first and second electromagnets.

5,150,977

RECORDING APPARATUS WITH DETECTOR FOR PAPER EDGE AND END OF RIBBON SENSING

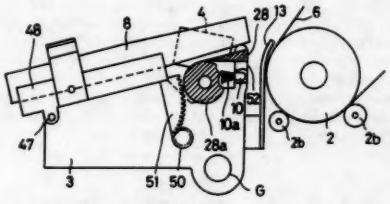
Junichi Yoshikawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 322,920, Mar. 14, 1989, abandoned. This application Dec. 18, 1991, Ser. No. 809,248

Claims priority, application Japan, Mar. 15, 1988, 63-59456; Feb. 27, 1989, 1-43301

Int. Cl.[5] B41J *35/36, 35/20, 29/44*

U.S. Cl. 400—703 **8 Claims**



1. A recording apparatus for recording on a recording medium, comprising:

a carriage;

a recording medium mounting portion for mounting the recording medium so it can be conveyed in a conveying direction;

an ink sheet mounting portion, supported on said carriage, for mounting an ink sheet having ink, with the ink sheet including an alarming portion indicating the end of the ink sheet, with said ink sheet mounting portion being reciprocally movable in a first direction across the recording medium and in a second direction along the conveying direction;

recording means for transferring the ink of the ink sheet to the recording medium, thereby recording on the recording medium;

detecting means, supported on said carriage, for detecting a size of the recording medium mounted on said recording medium mounting portion and for detecting the alarming portion on the ink sheet; and

driving means for driving said ink sheet mounting portion in the conveying direction and for eliminating the ink sheet from a position in front of said detecting means in order to detect the size of the recording medium.

5,150,978

WAX APPLICATOR WITH RUBBER BUMPER END

Bryan J. Stewart, and Victoria J. Stewart, both of 125 S. Santa Ynez, Santa Barbara, Calif. 93103

Filed Jul. 26, 1991, Ser. No. 736,712

Int. Cl.[5] A47L *13/30*

U.S. Cl. 401—14 **4 Claims**

1. A device for storing and applying wax-like substances comprising:

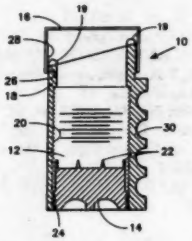
a tubular body having a threaded interior surface and a threaded exterior end, said exterior end being beveled;

a compliant ring affixed to said beveled end of said tubular body;

a plunger base having a plurality of projecting wax anchors for removably affixing solid wax to said base, said base being generally cylindrical and having a threaded exterior

surface for engaging with said tubular body's threaded interior surface, said plunger base having a thumb and finger groove oppositely disposed from said wax anchors;

a closed end cap having a threaded open end, said cap being threaded for removable engagement with said tubular body's threaded exterior end; and



means for threading said plunger base along said interior surface thereby moving any wax affixed to said anchors, in an undeformed manner, toward said threaded exterior end of said body and, without interference, beyond the circumferential confines of said body;

whereby said compliant ring affixed to said beveled end of said tubular body prevents abrasive contact between said tubular body and an object being waxed.

5,150,979

BALL POINT PEN WITH LIQUID INK

Paul H. Gallagher, 2530 Crawford Ave., Evanston, Ill. 60201

Continuation-in-part of Ser. No. 45,106, Jun. 4, 1979, abandoned. This application Sep. 16, 1985, Ser. No. 776,219

Int. Cl.[5] B43K *7/10*

U.S. Cl. 401—209 **17 Claims**

1. A writing pen comprising,

a barrel having a front end and an aperture in the front end and a writing ball operatively mounted in the aperture,

the barrel having a constantly rear-end vented reservoir constituted by an essentially open-space interior, and enabling free movement of the ink therein

means for filling the barrel to a pre-determined effective capacity with aqueous ink,

control means forming a capillary space operative for receiving ink from the main reservoir and holding it therein by capillary action, and feeding it by capillary action to the writing ball, and that capillary space constituting the only communication between the reservoir and writing ball, and

the control means being operative, when the writing pen is in front-end-down position, for confining all ink in the barrel, except that in the capillary space, and holding it separated from and out of contact with or continuity with the ink in the capillary space, and holding it against bearing on or having any action or influence on the writing ball or capillary space, whereby when the writing pen is in that position, only the ink in the capillary space has communication with the writing ball,

the capillary space being so positioned that, when the writing pen is adjacent horizontal position, the ink in the main reservoir has communication with the capillary space, and flows thereinto by capillary action.

5,150,980

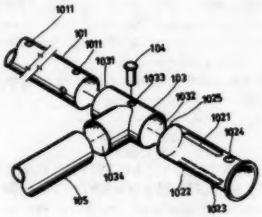
FIXTURE FOR A FOLDING BED

Yung-Hsiung Lin, No. 99 Tai Yuan Road, Taipei, Taiwan

Filed Oct. 17, 1991, Ser. No. 778,444

Int. Cl.[5] F16D *1/00*

U.S. Cl. 403—24 **3 Claims**



1. A fixture comprising:

a pipe connector made from a 3-way tube having a first outlet sleeved on a transverse frame tube on a folding bed at one end and firmly secured thereto by a rivet, a second outlet sleeved on a longitudinal frame tube on said folding bed at one side, a third outlet;

a side tube inserted through said third outlet and said first outlet into said transverse frame tube, said side tube having an elongated slot longitudinally made on the outer wall thereof at a suitable location through which said rivet is inserted, a unitary flexible strip formed thereon through the process of punching at a location opposite to said elongated slot, and a fastening hole on the outer wall thereof for fastening supporting means, said unitary flexible strip having a fixed end at one end secured to said side tube and a free end at an opposite end with a stop block made thereon at an outer side relative to said elongated slot; and

wherein said side tube is retained to said pipe connector by said rivet and can be moved in and out within the range of said elongated slot; said stop block on said flexible strip will be stopped against the peripheral edge of said third outlet to prohibit said side tube from moving back into said pipe connector again, or said stop block on said flexible strip can be squeezed inwards permitting said side tube to be moved inside said pipe connector.

5,150,981

BALL JOINT ASSEMBLY HAVING AN EXTENDED BALL SURFACE

Ikuhisa Miwa, Seki, Japan, assignor to Nippon Thompson Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 251,147, Sep. 29, 1988, abandoned. This application Sep. 10, 1991, Ser. No. 759,181

Claims priority, application Japan, Sep. 29, 1987, 62-242554

Int. Cl.[5] F16C *11/06*

U.S. Cl. 403—122 **4 Claims**

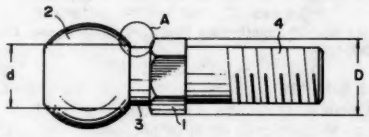
1. A ball unit for use in a ball joint assembly, said assembly including a ball unit, which is generally elongated in shape and

formed from a single columnar material, and a socket unit which may be operatively coupled thereto to provide a relative motion therebetween, said ball unit comprising:

a ball section formed at a top end of said ball unit and movably received in a socket section of said socket unit when assembled, said ball section providing a spherical contact surface contacting a spherical contact surface of said socket section;

a cut-away section formed immediately adjacent to said ball section and having a first diameter, said cut-away section being relatively short with respect to said ball section in a longitudinal direction of said ball unit;

a nut section formed adjacent to said cut-away section and



having a nut shape and a second diameter which is a diameter of a largest circle definable by said nut section and which is greater than said first diameter; and

a holding section formed adjacent to said nut section;

wherein said ball section includes an extended portion which partly extends longitudinally into and peripherally surrounds a space defined by said cut-away section and which is defined when said ball section is subjected to a ball deformation roll rolling process in the form of a circular cantilevered overhang having a substantially non-flat tip end of a predetermined portion of said ball section to thereby provide an extended spherical surface, said tip end defining a third diameter which is greater than said first diameter but smaller than said second diameter.

5,150,982

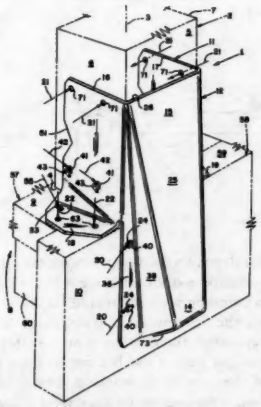
DECK POST TIE

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed Mar. 9, 1990, Ser. No. 491,325

Int. Cl.[5] F16B *9/00*; E04B *1/38*

U.S. Cl. 403—232.1 **9 Claims**



1. A wood post connection comprising:

a. an upright supported wood post member having a longitudinal axis, a base, a back side, and first and second sides;

b. a support structure having a first support surface for receiving said base of said upright supported wood post member thereon and a second support surface angularly related to said first support surface and substantially in the plane of said backside of said upright supported wood post member;

c. a rigid one piece connector having:

1. an elongated rigid overturnign moment resistant structural back member having a longitudinal axis including disposed upper flush portions in registration with said backside of said upright supported wood post member and disposed lower flush portions extending linearly beyond said base of said upright supported wood post member in registration with a portion of said second support surface of said support structure and an outer back member formed ins aid elongated rigid overturning moment resistant structural back member of said rigid one piece connector including a first triangular shaped side member integrally connected to said upper and lower flush portions of said rigid overturning moment resistant back member and said first triangular shaped side member extending angularly outwardly from said second support surface for resisting buckling upon the application of a selected moment force acting at an angle against said longitudinal axis of said upright supported wood post member;

2. a first side member angularly and integrally connected to a substantial portion of said upper flush portion of said elongated rigid overturning moment resistant structural back member and disposed for connection to said first side of said upright supported wood post member;

3. a second side member angularly and integrally connected to a substantial portion of said upper flush portion of said elongated rigid overturnign moment resistant structural back member and disposed for connection to said second side of said upright supported wood post member;

4. a first flange member angularly and integrally connected to a substantial portion of said first side member of said rigid one-piece connector and disposed for connection to said first support surface of said support structure;

5. a second flange member angularly and integrally connected to a substantial portion of said second side member of said rigid one-piece connector and disposed for connection to said first support surface of said support structure;

d. back connector fastening means joining said lower flush portion of said elongated rigid overturning moment resistant structural back member to said second support surface of said support structure;

e. side connector fastening means respectively joining said first and second sides of said rigid one-piece connector to said first and second sides of said upright supported wood post member; and

f. flange connector fastener means respectively joining said first and second flange members to said first support surface of said support structure.

5,150,983

CORNER LOCK

David R. Bogenhagen, Hudson, Wis., assignor to Andersen Corporation, Bayport, Minn.

Filed Jan. 8, 1991, Ser. No. 638,832

Int. Cl.[5] E06B *1/00*

U.S. Cl. 403—402 **7 Claims**

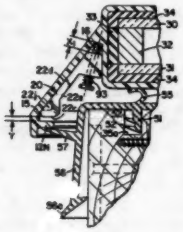
1. A corner fastener for use in securing first and second sash members together to form a corner of a sash, the sash members each having a mitred end and each sash member forming an opening and channel cavity at its mitred end, said channel cavities being a first channel cavity in said first sash member and a second channel cavity in said second sash member, said channel cavities having first corner surfaces and second, opposite corner surfaces, said fastener comprising:

(a) a first leg member having first and second ends and a

second leg member having first and second ends, said first ends operatively connected to each other at an intersection;

(b) said leg members generally conforming to a portion of the shape of said channel cavities;

(c) said leg members each having a threaded aperture formed therein for receiving fastening members, said



threaded apertures in general alignment to intersect the respective first corner surfaces; and

(d) wherein when the fastening members are tightened in said threaded apertures, the fastening members engage the first corner surfaces and move said leg members against said second corner surfaces, thereby tightening and securing the sash members together without the necessity of holes being formed in the sash members.

5,150,984

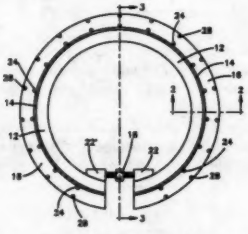
STIFFENING FLANGES FOR DEFORMATION RESISTANCE OF MANHOLE COVER SUPPORT

Harold M. Bowman, Fairview Park, and George T. Fuller, Chagrin Falls, both of Ohio, assignors to Harold M. Bowman, Fairview Park, Ohio

Continuation-in-part of Ser. No. 596,255, Oct. 12, 1990, Ser. No. 366,177, Jun. 13, 1989, Pat. No. 4,969,771, Ser. No. 362,257, Jun. 6, 1989, Pat. No. 4,963,053, Ser. No. 362,216, Jun. 6, 1989, Pat. No. 4,966,489, Ser. No. 536,691, Jun. 12, 1990, abandoned, and Ser. No. 560,184, Jul. 31, 1990, abandoned. This application Mar. 4, 1992, Ser. No. 846,518

Int. Cl.[5] E02D *29/14*

U.S. Cl. 404—26 **18 Claims**



1. In a manhole cover support adapted to raise the level of a manhole cover from a position of retention by a cover seat element and a housing element of an existing manhole cover-supporting structure to a new and higher level and there retaining it, the manhole cover support comprising a base that is adapted to fit into the housing element of the existing cover-supporting structure, said base having a top that is substantially in one plane for support of the cover, a bottom therebelow that is in another plane, and a cover keeper of sheet metal that is connected to and extends upwardly from the outer perimeter of the base, the improvement for increasing the resistance of the cover support to deformation which comprises:

a flanged outward top on said keeper, the resulting outward bend of said top being equipped with a succession of pressed-in gussets, the troughs of which slope with respect to the keeper.

5,150,985

METHOD OF DISPOSING OF SALT-CONTAINING DUSTS FROM INCINERATOR PLANTS

Werner Roesky, Overath; Dieter Deffner, Bergisch Gladbach, and Manfred Wolter, Leverkusen, all of Fed. Rep. of Germany, assignors to Sante Corporation, Largo, Fla.

Filed Oct. 17, 1990, Ser. No. 597,991

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1989, 3934948

Int. Cl.[5] B09B *3/00*

U.S. Cl. 405—128 **16 Claims**

1. A method of disposing of salt-containing dusts from incinerator plants comprising the steps of:

mixing salt-containing dusts, having approximately 1% or less lime, with cement and water, whereby the amount of cement is between 3% and 25% of the total mixture, and the amount of hydrothermally reactive powdered components is not less than 8% of the total mixture;

compacting the mixture into discrete compacts,

hardening the discrete compacts in an autoclave by saturated steam with a pressure of at least 1 bar to form stable compacts.

5,150,986

PROCESS AND APPARATUS FOR DEPOSITING SILT ON THE BOTTOM AND SLOPES OF THE WET OPEN WORKING OR DREDGING

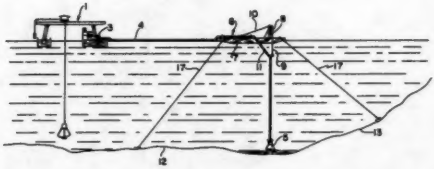
Wolfgang Rohr, Speyerer Str. 74-80, 6701 Otterstadt, Fed. Rep. of Germany

Filed Jan. 17, 1991, Ser. No. 642,348

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1990, 4001630

Int. Cl.[5] E02F *5/22*

U.S. Cl. 405—223 **3 Claims**



1. Process for depositing silt on the bottom and the slopes of a wet open landscape working having a borrow pit, in which silt material in common with recovered sand and gravel material taken from the borrow pit is transported to a treatment installation, separated there from usable material and then deposited as sealing silt on the bottom and the slopes of the borrow pit of the wet open working, characterized in that separated out silt is recovered, pumped over a flexible conveyance line to a floating discharge station supporting an underwater silt depositing system at an exactly determined place of the bottom and/or slope of the wet open working, which place is regularly shifted, and deposited there as a sealing discharge in a determined stratum thickness, and shifting the depositing system after reaching a stratum thickness.

5,150,987

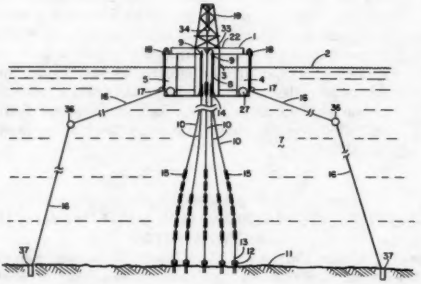
METHOD FOR INSTALLING RISER/TENDON FOR HEAVE-RESTRAINED PLATFORM

Charles N. White, and Riley G. Goldsmith, both of Houston, Tex., assignors to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 695,231, May 2, 1991, abandoned. This application Jan. 2, 1992, Ser. No. 817,026

Int. Cl.[5] E02B *17/00*

U.S. Cl. 405—224 9 Claims



1. A method for installing a riser/tendon for maintaining a floating structure in a heave-restrained mode comprising:

(a) running a first surface conductor and disposing the first surface conductor in the floor of a body of water on which the floating structure floats,

(b) drilling a borehole of smaller diameter than the first surface conductor through the first surface conductor to a depth sufficient for control of drilling fluid pressure,

(c) emplacing and cementing a second conductor inside the first surface conductor and the borehole,

(d) drilling a second borehole of smaller diameter than the second conductor through the second conductor to a depth sufficient for control of subterranean formation pressure,

(e) emplacing and cementing a casing string inside the second conductor for a pressure containment distance but not above the floor of the body of water and inside the second borehole to provide a multiple walled system for redundant well control,

(f) thereupon installing a surface blowout preventer system (BOPS) on the floating structure and the multiple walled system,

(g) drilling one or more successive boreholes through the casing string or successive casing strings until a successive borehole has penetrated a hydrocarbon bearing formation and emplacing and cementing one or more successive casing strings inside the successive boreholes and inside next successive casing strings for a pressure containment distance but not above the floor of the body of water,

(h) thereupon, while the hydrocarbon-bearing formation is isolated by a cemented successive casing, disconnecting and retrieving from above the floor of the body of water in sequence from smaller to larger one or more casings and/or conductors,

(i) thereupon, running and connecting or leaving in place one or more conductors and/or risers such that at least two tubulars connect in fluid tight double wall isolation the innermost casing at the floor of the body of water to the floating structure, and

(j) imparting tension on at least one of the two tubulars from the floating structure such as to suppress heave of the floating structure.

5,150,988

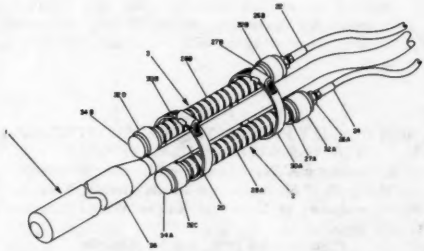
COMBINATION VIBRATOR, AERATOR, AND LIQUID-INJECTION SYSTEM

Paul E. Powell, 1801 Westlake Dr., #104, Austin, Tex. 78746, and Larry N. Britton, Rte. 3, Box 2140, Spicewood, Tex. 78669

Filed Feb. 12, 1991, Ser. No. 654,006

Int. Cl.[5] E02D *3/00*

U.S. Cl. 405—258 18 Claims



1. A device for introducing materials selected from the group including gases, microorganisms, nutrients, and other chemicals, into sediments in-situ comprising:

a multi-orificed, non-jetting aeration means for diffusing gases under pressure,

a multi-orificed, non-jetting liquid-injection means for diffusing materials contained in liquids under pressure,

a vibration means,

said aeration means and said liquid-injection means being attached to said vibration means whereby vibration causes said device to penetrate the sediment while releasing gases and liquids containing said materials into the sediments without unduly dispersing said sediments.

5,150,989

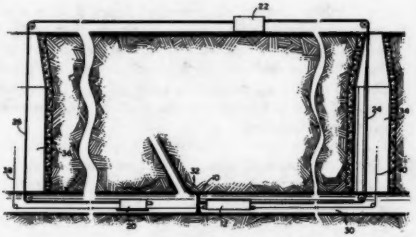
METHOD AND APPARATUS FOR LOCATING A SERVICE PIPE OUTLET TRANSVERSELY CONNECTED TO A LINED MAIN PIPE

Charles A. Long, Jr., and Todd W. Goodwin, both of Birmingham, Ala., assignors to Long Technologies, Inc., Birmingham, Ala.

Division of Ser. No. 517,121, May 1, 1990, Pat. No. 5,044,824. This application Jul. 9, 1991, Ser. No. 727,495

Int. Cl.[5] F16L *1/00*

U.S. Cl. 405—303 12 Claims



1. A remotely controlled locator material dispensing apparatus for use within a conduit having an axis to mark specific conduit locations for later identification, said locator material dispensing apparatus comprising:

control means located outside of the conduit for generating a plurality of control signals for controlling the operation of the locator material dispensing apparatus;

a first structural unit including a source of locator material to

be dispensed onto an interior surface of said conduit, said first structural unit being connected to said control means for receiving the control signals therefrom, and for dispensing the locator material from said first structural unit onto the interior surface of said conduit in accordance with the received control signals;

said first structural unit comprises:

a housing including a locator material storage chamber for storing locator material to be dispensed; and

locator material distributing means positioned on said housing and in fluid communication with said storage chamber for dispensing and distributing said locator material in accordance with the received control signals.

5,150,990

HIGH DENSITY PNEUMATIC TRANSPORT SYSTEM FOR USE WITH SOLID MATERIALS

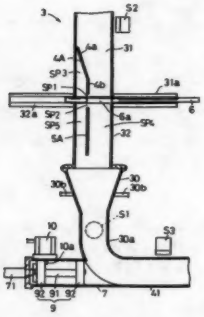
Kiyoshi Morimoto; Akikazu Iwamoto; Masahiko Shimizu; Teiichi Miwa, all of Shizuoka, and Kazue Murata, Nara, all of Japan, assignors to Kabushiki Kaisha Matsui Seisakusho, Osaka, Japan

Filed Oct. 31, 1990, Ser. No. 606,094

Claims priority, application Japan, Nov. 8, 1989, 1-290882

Int. Cl.[5] B65G *53/66*

U.S. Cl. 406—50 **2 Claims**



1. A high density pneumatic transport system for pneumatically transporting slid materials, said system comprising:

(a) a transport pipe;

(b) an airtight transport tank comprising:

an upper material storage chamber for storing solid materials supplied from a solid material manufacturing means;

a guide plate comprising a tapered upper portion and a vertical portion, said tapered upper portion being attached with the inner wall of said upper material storage chamber and said vertical portion extending from an end of said upper portion with space, at the bottom thereof, which is large enough to allow solid materials to pass therethrough;

a slide damper connected under said upper material storage chamber, said slide damper controlling the discharge of solid materials stored in said upper material storage chamber;

a lower material storage chamber connected under said slide damper;

a vertical partition provided in said lower material storage chamber with space, at the top thereof, which is large enough to allow solid materials to pass therethrough and also with space at the bottom thereof; and

a charge tank connected under said lower material storage chamber and provided with pressurized gas introduction pipes for taking materials out of the tank into said transport pipe;

(c) said transport pipe connected under said airtight transport tank comprising:

a lower horizontal pipe including accelerating means;

a vertical riser pipe connected with said lower horizontal pipe, said vertical pipe including decelerating means and accelerating means vertically arranged in the direction of material transportation; and

an upper horizontal pipe connected with said vertical riser pipe, said upper horizontal pipe including decelerating means at the upstream end thereof; and

(d) a collector connected with the terminal end of said upper horizontal pipe for receiving the transported materials,

whereby solid materials fed into said charge tank by opening said slide damper of said airtight transport tank are supplied into said transport pipe by feeding a pressurized gas intermittently into said charge tank, pushed forward at high density through said lower pipe and said vertical pipe, then decelerated by said decelerating means provided at the upstream end of said upper horizontal pipe so as to form a long column and finally collected into said collector under substantially gravitational fall.

5,150,991

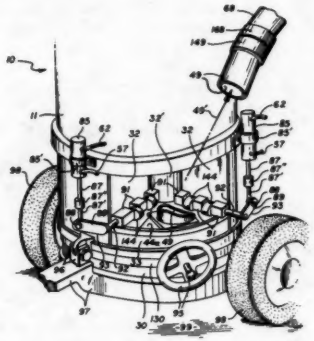
PARTICULATE-MATERIAL GUN WITH IMPROVED SEALING SYSTEM

David J. Stoner, Corona del Mar; Joseph M. Sanger, San Gabriel; Louis E. Pahoundis, La Crescenta, and James H. Riahi, San Dimas, all of Calif., assignors to Reed Manufacturing, Walnut, Calif.

Filed Jan. 24, 1991, Ser. No. 645,589

Int. Cl.[5] B65G *53/00*

U.S. Cl. 406—67 **50 Claims**



1. Apparatus for conveying particulate material such as gunite from a hopper to a delivery tube, and comprising:

means defining a receiving port for receiving such material from such a hopper;

means defining a discharge port for discharge of such material into such a delivery tube;

feed structure mounted for rotation and defining at least one chamber for receiving such material from the receiving port and for carrying received material by said rotation to the discharge port for discharge;

pneumatic means, defining and including a pneumatic supply orifice, for applying gas to blow material from the feed structure into the discharge port;

sealing means for substantially sealing a pneumatic path defined by the pneumatic supply orifice, the discharge port, such tube, and at least one chamber when generally in position for said discharge;

mechanical means for applying force to press the sealing means against the feed structure;

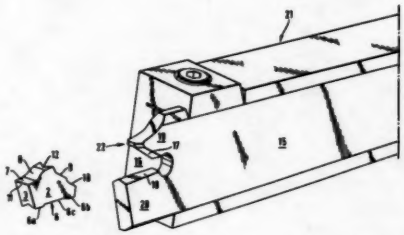
biasing means for applying a substantially regulated level of force to drive the mechanical means and to substantially stabilize the level of force applied by the mechanical means to press the sealing means against the feed structure.

5,150,992

CUTTING INSERT AND A CUTTING TOOL ASSEMBLY INCORPORATING SUCH AN INSERT

Jacob Friedmann, Kfar Havradim, Israel, assignor to Iscar Ltd., Tefen, Israel

Filed Sep. 27, 1990, Ser. No. 589,396
Claims priority, application Israel, Sep. 28, 1989, 91815
Int. Cl.[5] B23B *27/04*
U.S. Cl. 407—110 **6 Claims**



1. A cutting insert for use in a cutting tool assembly comprising first and second longitudinally directed insert surfaces directed at an acute angle with respect to each other and defining between them a centrally disposed, wedge-shaped body portion of the insert;

a leading end portion of the insert formed integrally with a wider end portion of the wedge-shaped body portion and formed with a cutting edge and with an abutment shoulder located between the cutting edge and an adjacent end of said first insert surface; and

a trailing end portion of the insert formed integrally with a narrower end portion of the wedge-shaped body portion and defined between a wholly recessed extension of said insert surface and said second insert surface, said second insert surface being formed with a central recessed portion.

5,150,993

PIVOT ASSEMBLY FOR TOOL GUIDE

Bernard Miller, 5600 Munhall Rd., Pittsburgh, Pa. 15217

Filed Jan. 30, 1992, Ser. No. 828,283
Int. Cl.[5] B23B *45/14*
U.S. Cl. 408—110 **20 Claims**

1. A tool guide pivot assembly for a hand held tool comprising:

a generally "U" shaped bracket having a base, a first leg and a second leg;

an adjustment shaft having a shaped extension near one end and an other end and being long enough to extend between said first and second legs of said "U" shaped bracket;

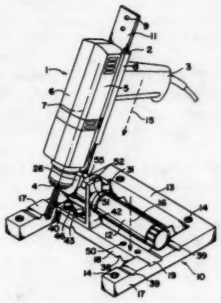
a post attachment means, shaped to fit between said first and second legs of said "U" shaped bracket, having a passage for said adjustment shaft;

a guide post attached to said post attachment means;

said first leg of said "U" shaped bracket having a shaped aperture for passage of said adjustment shaft;

said second leg of said "U" shaped bracket having an aperture for passage of said other end of said adjustment shaft;

a means for selectively adjusting the angle between said guide post and said "U" shaped bracket;



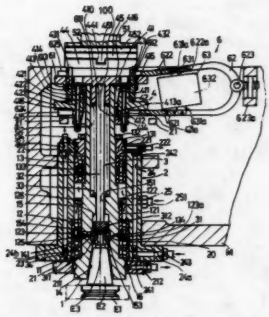
means for clamping said post attaching means in selected angular positions.

5,150,994

SPINDLE MEANS OF MACHINE CENTER

Kaven Hsu, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei, Taiwan

Filed Sep. 23, 1991, Ser. No. 763,576
Int. Cl.[5] B23C *9/00*; F16C *37/00*
U.S. Cl. 409—135 **5 Claims**



1. A spindle means of machine center comprising: a spindle rotatably mounted in a spindle sleeve fixed in a machine frame;

a tool holding means operatively connecting a tool chuck for clamping a tool thereon and held in a central portion in said spindle;

a driving motor operatively driving spindle for rotating said tool connected therewith by means of a transmission coupling means coupling said spindle and said motor; said spindle, said tool, said tool holding means, said transmission coupling means and said motor defining a common longitudinal axis about said axis said spindle and said tool being rotated; and

a tool-holding control means normally connecting said tool holding means with said spindle for rotating said spindle and said tool connected on said tool holding means, and operatively separating said tool holding means from said spindle;

said spindle sleeve including: a lower flange formed on a lower portion of the sleeve adjacent to a lower shoulder portion of the spindle and secured to a machine frame, a plurality of longitudinal cooling passages longitudinally formed through the sleeve parallel to the longitudinal axis of the spindle, a first perforated plug sealed in a first

longitudinal cooling passage of said plurality of said longitudinal cooling passages near a feeding port formed on a side portion of the spindle sleeve having a small orifice with a small inside diameter formed in the first perforated plug for directing a cooling liquid of high pressure fed in the first longitudinal cooling passage and a second perforated plug sealed in a second longitudinal cooling passage of said cooling passages distal from the feeding port having a large orifice formed in the second perforated plug with a large inside diameter larger than that of the small orifice of the first perforated plug for directing a cooling liquid of low pressure fed in the second longitudinal cooling passage for an even flow rate when delivering the cooling liquid through the longitudinal passages, a lower annular-ring groove annularly formed in a lower flange of the sleeve communicated with the feeding port, an upper annular ring groove annularly formed in an upper end portion of the sleeve communicated with a discharge port from which the cooling liquid is discharged, and at least a radial cooling passage radially formed in the sleeve for communicating a central sleeve hole formed in the sleeve and disposed around the spindle for delivering a cooling gas through a notch formed in a lower nut of a primary bearing set, which is formed between the spindle and the sleeve and is positioned below a secondary bearing set formed between said spindle and said sleeve for cooling the primary bearing set and the secondary bearing set.

5,150,995

COUPLING FOR A DETACHABLE FIXING OF COMPONENTS AT APPROPRIATE CARRIER MEMBERS

Josef Reinauer, Sigmaringen, Fed. Rep. of Germany, assignor to Gottlieb Guhring KG, Albstadt, Fed. Rep. of Germany

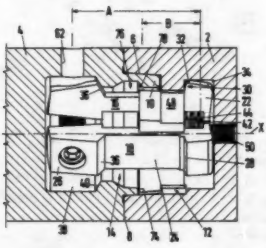
PCT No. PCT/EP90/00228, § 371 Date Sep. 13, 1990, § 102(e) Date Sep. 13, 1990, PCT Pub. No. WO90/09253, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 13, 1990, Ser. No. 573,218

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1989, 3904259

Int. Cl.[5] B23B *29/00*

U.S. Cl. 409—234 **15 Claims**



1. A coupling, which comprises:

a carrier member which includes a receiver having a shoulder and a recess;

a part having a plurality of centering extension means for being coupled to said receiver and an undercut recess;

chucking means including means for adjusting said chucking means which are actuable from the exterior of the part such that the carrier member and the part are forced against each other via a support ring surface pairing, said adjusting means including a set screw located in an axial plane of said centering extension means wherein said chucking means includes at least three circumferentially spaced clamp-like chuck claws which are respectively engaged substantially in a longitudinal axial plane of said centering extension, each of said chuck claws having an anchor portion for engaging said shoulder of said receiver and each having a radially outwardly projecting claw portion movable into said undercut recess of said part by screwing action of said set screw into one of said three claws for forcing a radially internal thrust head thereof against contacting portions of the two other chuck claws.

5,150,996

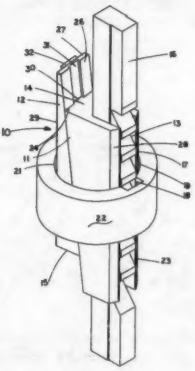
KEYWAY BROACH GUIDE ASSEMBLY

Glenn R. Thoroughman, 4925 Finance Way, Kingman, Ariz. 86401

Filed Aug. 1, 1991, Ser. No. 739,186

Int. Cl.[5] B23D *37/04*

U.S. Cl. 409—259 **10 Claims**



1. A broaching bushing means for guiding a broaching tool in a workpiece bore during the cutting of a keyway in an annular surface of the bore, consisting of:

an elongated wedge member and a broaching tool elongated guide member positionable in longitudinally abutting relation to one another to form a bushing means of substantially rectangular cross section for insertion in a workpiece bore,

the wedge member and the guide member each having a first side and a second side opposite the first side,

the first sides of each member having complementarily inclined surfaces which, when in abutting relationship, position the second side in parallel relationship to each other,

the wedge member and the guide member being longitudinally movable relative to one another to adjust the distance between the parallel sides of the bushing means,

wherein the rectangular cross section of the bushing means is adjustable to fit various sized bores.

5,150,997

ELASTIC CONNECTOR

Li J. Hsu, 4th Flr., No. 736 Ting Jou Rd., Taipei, Taiwan

Filed Feb. 25, 1991, Ser. No. 660,021

Int. Cl.[5] F16B *21/00*

U.S. Cl. 411—511 **13 Claims**

1. An elastic connector for securing mechanical parts together comprising:

a) a hollow base having a hole extending through the front and rear thereof, and including within its interior two wedge-shaped assembling grooves, a plate partioning the assembling grooves, two U-shaped grooves positioned at opposite corners, a hole adjacent a lateral side of each U-shaped groove, a pair of longitudinal holes at opposite ends of the plate, and a slanting groove connecting the longitudinal holes;

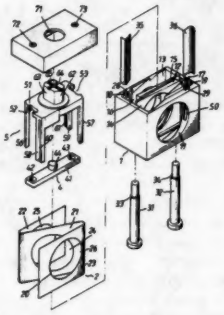
b) a pair of rivets received within the longitudinal holes;

c) an S-shaped spring member installed within the base and including two ends, a middle plate disposed within the slanting groove, two end plates disposed within the assembling grooves, and a hole formed in each of the middle and end plates corresponding in size to the hole through the base;

d) a pair of steel sheets disposed within the U-shaped grooves;

e) a supporting member including a pair of holes positioned at two ends thereof for receiving the rivets therethrough and a central axle rod extending upwardly therefrom;

f) a control member including a base plate, a pair of arc-shaped holes formed at each of two opposite ends for receiving the rivets therethrough and permitting the control member to move within the areas defined by the



arc-shaped holes, a bottom surface defining a concavity for receiving the supporting ember, an axle hole for receiving the axle rod, a rod extending downwardly from each of four corners of the base plate, each of two rods being disposed within a groove hole for urging the steel sheets into a U-shaped configuration, each of the other two rods being provided with a longitudinal gap therethrough for receiving the two ends of the spring members, and a handle extending upwardly from the base plate for engagement by a spanner to rotate the control member; and

g) a lid provided with a central hole and two end holes, the handle being disposed through the central hole and the rivets being disposed through the end holes, a bottom chamber, and the base plate of the control member being disposed within the bottom chamber.

5,150,998

SHEET BINDER

Koichi Murakami, Yokohama; Kazuhiro Matsuo, Tokyo; Kenichi Iizumi, Ibaraki, and Yoichi Tagawa, Ushiku, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Daiichi Seiki Kaisha Kabushiki Kaisha, Ibaraki, both of, Japan

Filed Jan. 8, 1992, Ser. No. 817,960

Claims priority, application Japan, Apr. 13, 1989, 1-094206; May 8, 1989, 1-114534; May 8, 1989, 1-114535; May 8, 1989, 1-114536; Jul. 19, 1989, 1-188290

Int. Cl.[5] B42C *13/00*

U.S. Cl. 412—14 **4 Claims**

1. A sheet binding apparatus, comprising:

supporting means for supporting a set of sheets;

punching means for punching the sets of sheets on said supporting means;

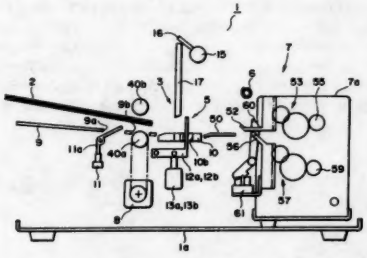
binding means for binding the sheets by penetrating a ring member through punched holes of the sheets punched by said punching means;

size signal generating means for generating a signal indicative of a size of the ring member supported on said binding means;

means for changing a degree of opening of the ring member in accordance with a size of the ring member;

conveying means for conveying the set of sheets punched by said punching means to the ring member supported on said binding means;

second supporting means for supporting said binding means for movement between an automatic mode position wherein said binding means receives the set of sheets



conveyed by said conveying means and a manual mode position wherein the set of sheets can be received without use of said conveying means;

detecting means for detecting the manual mode position of said binding means and for prohibiting conveyance of the sheets by said conveying means;

ring control means for controlling the degree of opening of the ring member during the manual mode;

wherein said ring control means opens the ring member to the degree of opening predetermined in accordance with the size of the ring member.

5,150,999

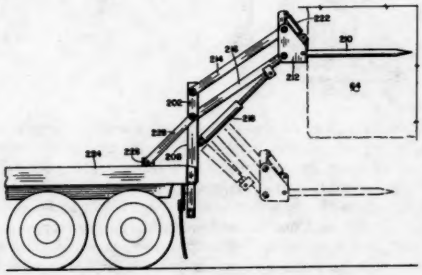
BALE LIFTER AND MOVER

Joe W. Dugan, Ballerina Cir., Box 87-A, Grove, Okla. 74344

Filed Oct. 9, 1990, Ser. No. 597,486

Int. Cl.[5] B66F *9/18*

U.S. Cl. 414—24.5 **6 Claims**



3. A device for lifting and moving a bale of hay and adapted to be connected to an end of a vehicle comprising a vertical support connected to the end of the vehicle; the vertical support having a horizontal first cross member located approximately midway of the height of the vertical support member; a second horizontal cross member pivotally mounted on the vertical support above the first cross member; a pair of horizontally spaced vertical plates disposed forward of the vertical support and having upper, lower, forward and rear ends; a horizontal bar extending across the forward ends of the spaced vertical plates; a spear connected to the center of the horizon-

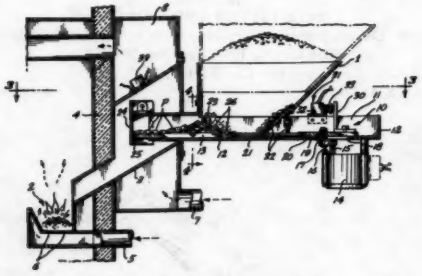
tal bar and projecting the forwardly and horizontally therefrom; a pair of spaced parallel links having forward ends and rear ends, the forward ends of the links being connected to the upper ends of the spaced vertical plates and the rear ends of the links being connected to the upper end of the vertical support; a third link having a forward end and a rear end, the forward end being connected to the lower end of the spaced vertical plates by means of a third cross member which extends across the lower rear ends of the spaced vertical plates, the rear end of the third link being connected to the second pivotal cross member on the vertical support; the third link being arranged below and parallel with the pair of links; a hydraulic cylinder having a piston rod extending outwardly therefrom, the hydraulic cylinder having a pivotal connection at one end thereof to the first cross member of the horizontal support, the piston rod having an outer end pivotally connected to the third link adjacent its point of connection to the pair of spaced vertical plates.

5,151,000

PELLET STOVE FEEDER

Rod Geraghty, 15731 SE. 224th, Kent, Wash. 98042, and Robert D. Burgess, Seattle, Wash., assignors to Rod Geraghty, Kent, Wash.

Filed Jun. 24, 1991, Ser. No. 719,910
Int. Cl.[5] F23K *3/12*
U.S. Cl. 414—187 **10 Claims**



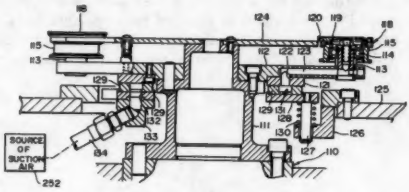
1. Mechanism for feeding fuel pellets to a firebox comprising a pellet hopper having a bottom outlet opening, a feed trough extending generally horizontally from below said hopper outlet opening and having a forward end portion adjacent to the firebox, a feed plate mounted in said trough below said hopper outlet opening such that pellets from said hopper are supported on said feed plate, means for reciprocating said feed plate in said trough between a rearward position adjacent to said hopper and a forward position adjacent to the firebox for advancing feed pellets along said trough from the hopper toward said firebox, a gate member mounted adjacent to said forward end portion of said feed trough and positioned such that said feed plate engages said gate member when said feed plate is in its forward position and closes said feed trough and said hopper from the firebox when said plate is in such position, and said feed plate discharging the pellets through a gap between said gate member and said forward end portion of said feed trough when said feed plate is moved from its forward position to its rearward position.

5,151,001

APPARATUS FOR ROTATING TOP ENDS OF CANS

Akira Kawaguchi; Tatsuyuki Suzuki, both of Asago, and Michihito Yoshida, Suntou, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Feb. 22, 1990, Ser. No. 482,983
Claims priority, application Japan, Feb. 22, 1989, 1-42089; Feb. 22, 1989, 1-42090; Feb. 23, 1989, 1-43779
Int. Cl.[5] B65H *1/00*
U.S. Cl. 414—225 **26 Claims**



1. A rotating apparatus for a plurality of top-ends, each of said top-ends having a first annular projection projecting in an axial direction thereof and a second annular projection projecting radially outwardly thereof, said rotating apparatus comprising:

a turntable disposed so as to be rotatable intermittently about an axis thereof and defining a transport path for said top-ends along an outer periphery thereof;

a plurality of stationary work stations arranged along said transport path in spaced relation to each other;

a plurality of top-end holding platforms arranged on the outer periphery of said turntable in circumferentially spaced relation to each other along said transport path so as to correspond to said work stations, respectively, and being movable together with said turntable about the axis thereof along said transport path, at least one of said top-end holding platforms being rotatable about an axis thereof relative to said turntable;

means for rotating said at least one top-end holding platform about the axis thereof;

each of said top-end holding platforms having an annular positioning groove formed in an upper face thereof for receiving the annular projection of the top-end;

ventilation passage means having one end opening to the upper face of said top-end holding platform; and

suction-air source means connected to the other end of said ventilation passage means;

wherein each of said annular positioning grooves has opposite side faces formed so as to be equal to each other in an angle defined between each of the side faces and a center line therebetween which extends perpendicular to the upper face of a corresponding one of said top-end holding platforms.

5,151,002

FREIGHT CAR FOR BULK MATERIAL

Josef Theurer, Vienna, and Friedrich Oellerer, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jan. 31, 1991, Ser. No. 648,214
Claims priority, application Austria, Feb. 15, 1990, 351/90
Int. Cl.[5] B65G *67/02*
U.S. Cl. 414—339 **2 Claims**

1. A freight car for incorporation into a freight train of a series of successively arranged like freight cars, successive ones of the freight cars having facing ends which may be coupled together to form the train, the freight car comprising

(a) a longitudinally extending carrier frame,

(b) a longitudinally extending box for storing bulk material,

the box having a bottom affixed to the carrier frame and an open top,

(c) a longitudinally extending wall separating the box into two halves,

(d) a first longitudinally extending bulk material conveyor arrangement, the conveyor arrangement having opposite ends longitudinally spaced from each other and one of the conveyor arrangement ends being higher than the opposite conveyor arrangement end whereby the conveyor arrangement ends at facing ends of the successive freight cars overlap when the freight cards are coupled together,

(e) a second longitudinally extending bulk material conveyor

arrangement, the second conveyor arrangement also having opposite ends longitudinally spaced from each other and one of the second conveyor arrangement ends being higher than the opposite second conveyor arrangement end whereby the second conveyor arrangement ends at facing ends of the successive freight cards overlap when the freight cards are coupled together,

(f) the first and the second conveyor arrangements extending independently of each other at least partly along the bottom of the box in the respective halves of the box, and

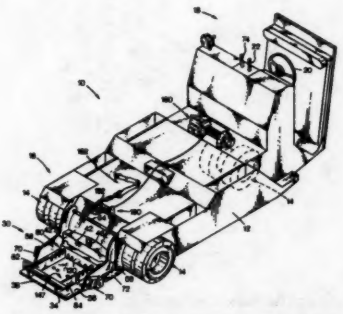
(g) drive means connected to the conveyor arrangements and arranged to drive the conveyor arrangements in opposite directions.

5,151,003

UNIVERSAL AIRCRAFT NOSEWHEEL CRADLE AND TUG ASSEMBLY

Robert A. Zschoche, Astoria, Oreg., assignor to Eric W. Paulson, Oreg.

Filed Nov. 30, 1990, Ser. No. 621,070
Int. Cl.[5] B60B *29/00*
U.S. Cl. 414—428 **17 Claims**



1. An aircraft nosewheel cradle assembly for an aircraft tug, comprising:

a cradle member having an upper surface with a front edge, a transverse axis extending substantially parallel with the front edge, and a longitudinal axis perpendicular to the transverse axis and substantially parallel with the upper surface, pivot attachment means for pivotally attaching the cradle member to the tug for rotatable motion solely about said transverse axis between a lowered aircraft loading position and an elevated aircraft transport position;

means for moving said cradle member between said loading position and said transport position;

a pair of lateral substantially mutually parallel arms adjustably mounted to the upper surface of the cradle member substantially parallel with the longitudinal axis, means for adjustably mounting said lateral arms to provide lateral adjustment in a direction parallel to said transverse axis, each lateral arm having plural rear gate receiving means for mounting a rear gate thereto; and

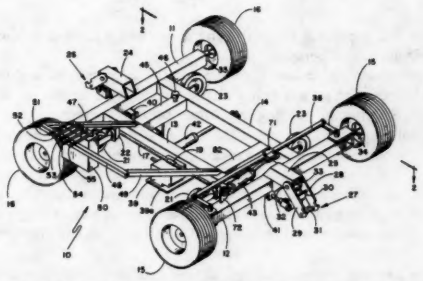
a rear gate adjustably mounted to one of the plural rear gate receiving means on each of the lateral arms substantially parallel with the transverse axis, said plural rear gate receiving means providing longitudinal adjustment of said rear gate in a direction parallel to said longitudinal axis, so as to define an aircraft nosewheel receiving corral on the upper surface of the cradle member between the lateral arms and the rear gate, with the corral size adjustable to accommodate varying sized aircraft nosewheels.

5,151,004

VEHICLE FOR MOVING AIRCRAFT

Lindley C. Johnson, Argyle, Minn., assignor to Johnson Airspray, Inc., Argyle, Minn.

Filed Apr. 5, 1991, Ser. No. 680,846
Int. Cl.[5] B65G *67/02*
U.S. Cl. 414—495 **13 Claims**



1. A parking carriage for lifting and conveying fixed wing aircraft in a generally lateral direction comprising:

a carriage chassis including a frame for supporting and conveying an airplane;

a first set of wheels including a pair of steerable wheels and at least one powered wheel mounted from the carriage chassis frame and deployed to support and convey the carriage chassis relative to a second set of wheels;

the second set of wheels deployed generally at an angle to the first set of wheels and used to maneuver the carriage chassis to address landing gear of an airplane of interest, the second set of wheels being mounted from the carriage chassis frame and arranged to alternatively support and convey the carriage frame in lieu of the first set of wheels when the second set of wheels is deployed in a supporting position;

mechanized steering means connected to the pair of steerable wheels for steering the carriage chassis when supported by the first set of wheels;

mechanized wheel deployed means using a single operating means for modulating the relative vertical position of the first and second sets of wheels to automatically change carriage chassis support between the first and second set of wheels;

load lifting means comprising a pair of vertically pivoting hook means, one located on either side of and associated with the carriage chassis, the hook means engaging and vertically displacing desired spaced portions of the landing gear of an airplane of interest, the hook means further

raising and lowering the airplane of interest thereby shifting support of the airplane of interest between the landing gear and the carriage chassis;

power-operated mechanical means for operating each of the mechanized; and

control means for controlling the power operating mechanical means.

5,151,005

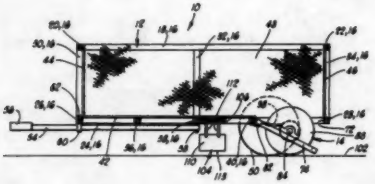
CAN COLLECTION APPARATUS

Kenneth W. Spigner, P.O. Box 77, Tatums, Okla. 73087

Filed Sep. 7, 1990, Ser. No. 579,161

Int. Cl.[5] B60P *1/00*

U.S. Cl. 414—437 **27 Claims**



1. An apparatus for collecting cans from a ground surface, said apparatus comprising:

can receiving means for receiving the cans therein, said can receiving means being characterized by a basket portion defining an opening in a lower portion thereof;

can collecting means disposed in said opening, movably connected to said can receiving means between an operating position adjacent to said ground surface and a non-operating position spaced above said ground surface, for engaging cans on said ground surface when in said operating position and moving said cans into said can receiving means; and

a carriage wheel attached to said can collecting means for supporting said can collecting means above said ground surface when said can collecting means is in said operating position, said carriage wheel being spaced above said ground surface when said can collecting means is in said non-operating position.

5,151,006

AUTOMATIC CHARGING MEMBER

Tom E. Marttila, Helsinki; Tuomo V. J. Kivistö, Kirkkonummi, and Pentti V. Ahola, Kokkola, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

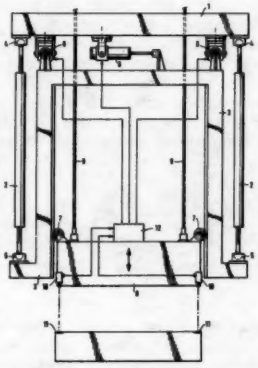
Filed Jun. 20, 1989, Ser. No. 369,055

Claims priority, application Finland, Jun. 22, 1988, 883012

Int. Cl.[5] B66C *13/08*

U.S. Cl. 414—626 **3 Claims**

1. Automatic charging member for the positioning of heavy loads, particularly of sheet-like objects as anodes and cathodes into electrolysis tanks, which charging member has a loading member and a gripping device for gripping the load and position detectors for positioning the gripping device relative to the load, wherein between the loading member and the gripping device there is attached a control frame movable with respect to the loading member so that on the basis of information received form said position detectors positioning of the gripping device is carried out by moving the control frame and wherein the control frame and the gripping device are supported on the loading member by separate suspension members.



5,151,007

INDUSTRIAL USE ROBOT WITH HORIZONTAL MULTIPLE ARTICULATED ARMS WITH MEANS TO MINIMIZE OR ELIMINATE INTERFERENCE AMONG DRIVING PORTIONS

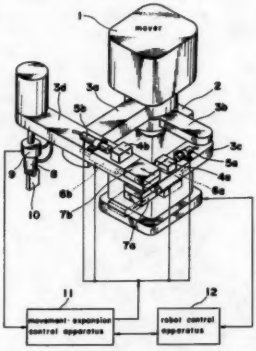
Tomohiro Maruo, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 20, 1991, Ser. No. 657,817

Claims priority, application Japan, Feb. 20, 1990, 2-37304

Int. Cl.[5] B25J *9/06*

U.S. Cl. 414—744.2 **9 Claims**



3. An industrial robot, comprising:

a first prime mover and a second prime mover each for producing horizontal rotational movement around coaxial shafts;

a plurality of horizontal articulated type arms connected in a parallelogram link arrangement and having a first arm having one end connected to said first prime mover for being driven in horizontal rotational movement around said one end, a second arm having one end connected to said second prime mover for being driven in horizontal rotational movement around said one end, a third arm coupled at one end to said second arm, and a fourth arm

coupled at one end to said third arm and coupled to the other end of said first arm;

a first load movably mounted on said third arm for reciprocal movement therealong, and a second load movably mounted on said fourth arm for reciprocal movement therealong;

movement mechanisms on the respective third and fourth arms and connected to the respective first and second loads for moving the respective loads individually along said third and fourth arms;

a first extension portion movably mounted on said third arm for extension and retraction movement therealong, and a second extension portion movably mounted on said fourth arm for extension and retraction movement therealong;

extension mechanisms on the respective third and fourth arms and connected to the respective first and second extension portions for moving the respective extension portions individually along said third and fourth arms, whereby said extension portions change the length of the respective arms;

a grasping mechanism on said fourth arm for grasping an object and picking it up and moving it by the movement of said arms;

a force sensor in said grasping mechanism for sensing the weight of an object picked up by said grasping mechanism;

a control apparatus connected to said movement mechanisms and to which said force sensor is connected for controlling the movement of the respective loads and extension portions in response to signals from said force sensor; and

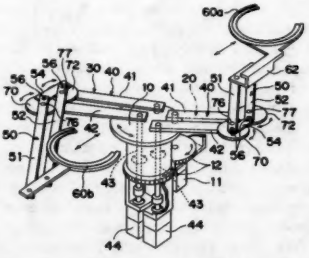
a further control apparatus connected to said prime movers and to said grasping mechanism for controlling the operations of said prime movers to drive said arms and the operation of said grasping mechanism to pick up and place an object, and to which said firstmentioned control apparatus is connected for supplying information relating to the movements of the respective loads and extension portions for modifying a formula for the relative movement of the first and second prime movers so as to offset the dynamic interference components thereof in accordance with the movements of the loads and extension portions in response to the change in weight of an object to be grasped.

5,151,008

SUBSTRATE TRANSFER APPARATUS

Toshimichi Ishida, and Masaki Suzuki, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 21, 1991, Ser. No. 703,777
Claims priority, application Japan, May 25, 1990, 2-135908
Int. Cl.[5] B25J *18/00*
U.S. Cl. 414—744.5 **3 Claims**



1. A substrate transfer apparatus comprising:

two transfer arms pivotably mounted on a support table on opposite sides thereof from each other with respect to a center of the support table;

each of the transfer arms having:

a first set of parallel links;

a second set of parallel links, a shaft pivotably connecting one end of each link in the first set of links to one end of a corresponding link in the second set of links, and a first gear fixed to one of the one ends of the first set of links, a second gear fixed to one of the one ends of the second set of links, said gears being engaged with each other, and a connecting link having each end connected to one of the shafts, the other ends of the first set of links being pivotably connected to the support table; and

a substrate holding member provided on the other end of the second set of links;

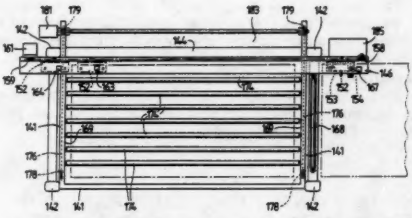
each of the substrate holding members being movable outward from the support table along a line by stretching of the transfer arms and being movable back to the support table by bending of the transfer arms, and the transfer arms being bent in the opposite direction to each other with respect to the support table.

5,151,009

MATERIALS STACKING EQUIPMENT

Timothy L. Lockert, 2604 Vestavia Forest Pl., Vestavia, Ala. 35216

Division of Ser. No. 374,543, Jun. 30, 1989, Pat. No. 5,049,030.
This application Mar. 25, 1991, Ser. No. 674,181
Int. Cl.[5] B65H *29/10*
U.S. Cl. 414—793.5 **2 Claims**



1. Apparatus for stacking onto a stacking table a plurality of semi-rigid sheet-like members received sequentially from a processing unit in an aligned condition comprising:

(a) means for grasping said sheet-like members along a margin on one side of said sheet-like member to maintain the alignment of said sheet-like member, said means for grasping being selectively movable in a first and second horizontal direction parallel to said one side between a receiving position and a releasing position;

(b) a plurality of elongated roller members extending parallel to said first horizontal direction, and selectively movable laterally to an extended position and to a retracted position subjacent said means for grasping with an outermost roller of said plurality of roller members being connected to means for selectively urging said outermost roller to said extended position and said retracted position;

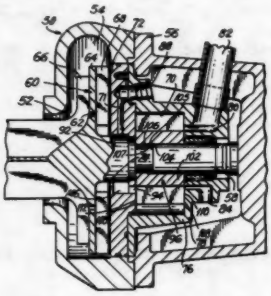
(c) flexible connective means for connecting each of said elongated rollers such that movement of said outermost roller causes selective movement of said elongated rollers to an abutting position or a separated position relative to adjacent elongated rollers such that said plurality of roller members move laterally responsive to the movement of said outermost roller said rollers being maintained in mutual horizontal alignment in said retracted position; and

(d) first means for sensing the presence of said grasping means at said releasing position with said first sensing means being operatively connected to actuate movement of said roller members from said extended position to said retracted position.

5,151,010
COMBINED CENTRIFUGAL AND VACUUM PUMP

Reijo Vesala, Kotka, and Vesa Vikman, Kymi, both of Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Sep. 7, 1990, Ser. No. 579,405
Int. Cl.[5] F01D *25/32*
U.S. Cl. 415—169.1 10 Claims



1. A centrifugal pump for pumping gas containing medium comprising:

a centrifugal pumping chamber (**54**);

a centrifugal impeller (**60**) within said pumping chamber;

a liquid ring vacuum pump (**70**) having a vaned vacuum pump rotor (**96**) therein;

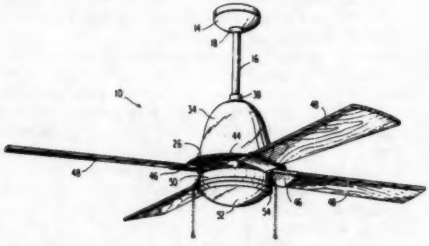
an intermediate wall (**72**) separating said pumping chamber (**54**) from said vacuum pump (**70**) and having a first non-annular opening (**74**) adjacent said pumping chamber for providing a passageway between said centrifugal pumping chamber (**54**) and said vacuum pump; and

a shaft (**58**) extending through said vacuum pump (**70**) and said intermediate wall (**72**) into said pumping chamber (**54**), said centrifugal impeller (**60**) and said vacuum pump rotor (**96**) being mounted on said shaft.

5,151,011
CEILING FAN WITH INTERCHANGEABLE BODY

Ron Rezek, Los Angeles, Calif., assignor to Beverly Hills Fan Company, Woodland Hills, Calif.

Continuation of Ser. No. 638,958, Jan. 9, 1991, abandoned. This application Feb. 27, 1992, Ser. No. 841,858
Int. Cl.[5] F04D *29/64*
U.S. Cl. 416—5 4 Claims

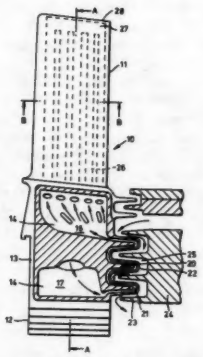


1. In a ceiling fan of the type supported from a ceiling by stationary down rod, a stationary assembly attached to the lower end of the down rod, an electric motor supported from the stationary assembly, fan blades driven by the motor, a top cover covering the motor and at least a lower portion of the down rod, and a bottom cover supported from a stationary assembly below the fan blades with improvements comprising, the top and bottom covers being removable, replaceable and interchangeable, the top and bottom covers formed of glass or translucent material and being of decorative shape and color, the interchangeability allowing different shapes and colors of the top and bottom covers to be utilized, bumper means on the stationary assembly for supporting a bottom edge portion of the top cover, a top nut annular member surrounding the down rod and postioned above the top cover for holding the top cover down against the stationary assembly bumper means by the top nut annular member cooperating with the top of the top cover.

5,151,012
LIQUID COOLED AEROFOIL BLADE

Geoffrey S. Hough, Littleover, England, assignor to Rolls-Royce plc, London, England

Filed Feb. 2, 1982, Ser. No. 347,986
Claims priority, application United Kingdom, Mar. 20, 1981, 8108753
Int. Cl.[5] B63H *1/14*
U.S. Cl. 416—95 6 Claims



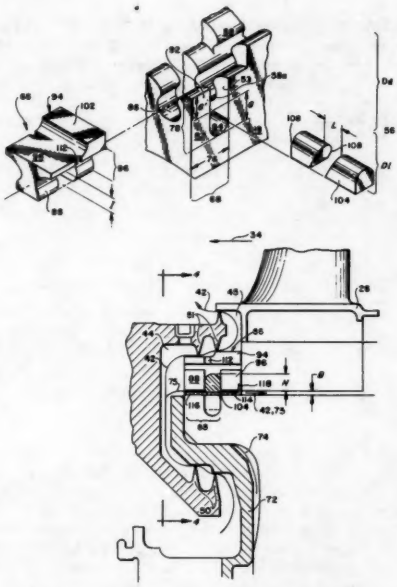
1. A cooled aerofoil blade having a closed cycle cooling system comprising an aerofoil cross-section portion, a root portion for the attachment of said aerofoil blade to the periphery of a rotary disc, and a shank portion interconnecting said aerofoil portion and said root portion, said closed cycle cooling system comprising at least one pair of chambers enclosed within said shank portion and disposed so that one chamber is situated closer to said root portion than the other chamber, a heat exchanger for condensing a vapourised liquid passing therethrough, said heat exchanger being positioned on an external face of said shank portion and arranged in operation to be cooled by a flow of cooling air, said heat exchanger operatively interconnecting said at least one pair of chambers, and a plurality of passages provided within said aerofoil portion extending generally lengthwise thereof and terminating in a chamber defined within the tip of said aerofoil portion, at least one of said passages being located in the central region of said aerofoil portion and interconnecting said tip chamber with said shank chamber which is closer to said root portion, the remainder of said passages being located adjacent the external surface of said aerofoil portion and interconnecting said tip chamber with the other shank chamber, said closed cycle cooling system containing a liquid which is vapourised at the temperatures at which said aerofoil portion is adapted to operate and condensed at the temperatures at which said heat exchange is adapted to operate.

5,151,013

BLADE LOCK FOR A ROTOR DISK AND ROTOR BLADE ASSEMBLY

Jerry H. Moore, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1990, Ser. No. 634,906
Int. Cl.[5] B63H *1/20*
U.S. Cl. 416—221 10 Claims



1. A rotor disk and rotor blade assembly of the type having an axis of rotation which is adapted for use in an axial flow rotary machine having a working medium flowpath, the rotor disk including a first side and a second side facing in opposite axial directions and a rim region having a circumferentially continuous live rim region and a circumferentially discontinuous dead rim region, the dead rim region having a plurality of blade attachment slots extending in an axially oriented direction from the first side of the disk, the assembly including a plurality of rotor blades each having an airfoil extending outwardly from each of said attachment slots and having a root which engages the attachment slot, the improvement which comprises:

a rotor disk having a projection which extends axially from the live rim region of the first side of the rotor disk the projection having an inner part which extends axially form the first side of the disk and an outer part which extends radially outward form the inner part;

a blade lock which engages the outer part of the projection, and which extends from the projection to the dead rim to shield the dead rim, the blade lock being spaced for the first side of the dead rim of the disk over a portion of radial height of the blade lock to leave na insulating gap therebetween; and,

lock means from blocking axial movement of the blade lock; wherein shielding the dead rim of the disk reduces thermal gradients and stresses and wherein the axial projection supports at least part of the blade lock form the live rim of the disk and extends axially and radially about the blade lock to restrain the blade lock against radial and lateral movement.

5,151,014

LIGHTWEIGHT AIRFOIL

C. Kent Greenwald, Cambridge; Leslie M. Gray, Lincoln; R. Bart Read, Maynard, and William Stevens, Belmont, all of Mass., assignors to Airflow Research and Manufacturing Corporation, Watertown, Mass.

Continuation of Ser. No. 374,302, Jun. 30, 1989, abandoned.
This application Jul. 26, 1991, Ser. No. 737,563
Int. Cl.[5] B64C *3/44*
U.S. Cl. 416—237 9 Claims

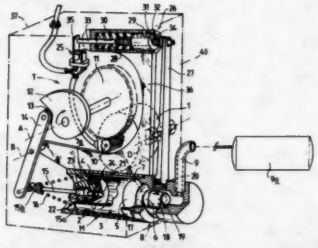
1. An airfoil comprising a suction surface and a pressure surface, said surfaces joined together at landing and trailing portions of said airfoil, said pressure surface converging toward said suction surface by an angle approximately equal to or greater than 30° to form an abrupt corner wherein during operation an air stream flowing from said leading edge and over said pressure surface separates from said pressure surface at said corner and reattaches to said pressure surface at a section of said pressure surface substantially closer to said trailing edge and wherein said abrupt corner is characterized by an abrupt change in the slope of said pressure surface at said corner and appears in a cross-sectional view of the airfoil to be formed by the intersection of a first and a second line wherein said first line corresponds to the pressure on one side of the abrupt corner and the second line corresponds to the pressure surface on the other side of the abrupt corner.

5,151,015

COMPRESSION DEVICE, PARTICULARLY FOR THE PRESSURE FILLING OF A CONTAINER

Daniel Bauer, Le Raincy; Frédéric Leroy, Saint-Cloud; Gérard Braque, Mitry-le-Neuf, and André Charon, Louvres, all of France, assignors to L'Oreal, Paris, France

Filed May 13, 1991, Ser. No. 698,684
Claims priority, application France, May 15, 1990, 90 06043
Int. Cl.[5] F04B *9/04*
U.S. Cl. 417—415 17 Claims



1. Device for th compression of a fluid, particularly for the pressure filling of a container, comprising a motor, a pump body, a piston adapted to be displaced linearly in said pump body, transmission means between the motor and said piston adapted to convert the rotary motion generated by the motor into a reciprocating, translatory motion by the piston, speed varying means adapted to impart a different speed to said piston according to the resistance opposing the motor during one complete admission and compression cycle, so that the resisting torque is substantially constant, wherein:

the compression fluid is a gas;

the speed varying means includes a cam for controlling

displacement of piston to satisfy the relation PV=constant, for an isothermal compression of a perfect gas, where P is the pressure of the compressed fluid and V is the volume of the compressed fluid, and the cam allows for compression of the compressed fluid at constant power; and

the speed varying means limiting heating of the compressed fluid which results from a difference between theoretical properties of a perfect fluid and actual properties of the compressed fluid as well as friction by controlling piston speed thus ensuring substantial isothermal compression; and wherein

the pump body is a syringe body having a cylindrical wall connected by a truncated wall to a nose;

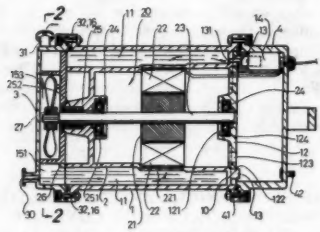
a casing is included having an end fitting at a closed end containing the syringe body, the end fitting being located at the nose and connected by a pipe to the container.

5,151,016

LIQUID PUMP RESPONSIVE TO TEMPERATURE

Tser W. Her, No. 16, Lane 946, Mintsu 1 Rd., Tsoying Dist., Kaohsiung, Taiwan

Filed Dec. 5, 1991, Ser. No. 802,512
Int. Cl.[5] F04D *15/00, 29/58*
U.S. Cl. 417—32 **6 Claims**



1. A liquid pump comprising;

an outer housing made together with an inner housing by means of injecting molding, having a cylindrical shape with a flange at both longitudinal sides to combine with a right cap and a left cap by means of bolts and nuts;

an inner housing of a cylindrical shape diametrically smaller than the outer housing to be axially fixed in the outer housing, having a metal cylinder inside for containing a motor consisting of a rotor, a stator and a shaft in its interior, and having its right side sealed up with an intermediate cap and its left side sealed up with a sealing disc;

an intermediate cap sealing up the right side of the inner housing, having a central shaft supporter with a copper ring for a bearing to fit in to support the motor shaft also supported in a bearing fitted in a copper ring of a shaft supporter of the inner housing, several curved slots for air to flow in and out of the inner housing, being sealed up by a right cap combined with the outer housing, and forming a pressure room with the right cap;

a liquid cooling room surrounded by the longitudinal walls of the inner and the outer housing, an annular bottom wall formed between the right side edges of both the inner and the outer housing and a sealing disc, the cooling room being for the liquid pumped by this pump to circulate therein to cool a motor contained in the inner housing;

a sealing disc sealing up the left side of the inner and the outer housing, having a central hole for the motor shaft to extend out for a fan to be fixed on the shaft end, an annular wall extending sidewise out of the outer surface, an opening just under the bottom portion of the annular wall, said opening being inserted by a projection extending out of the left side wall of the inner housing, and said annular wall having a passage;

a right cap combined with the right side flange of the outer housing, forming a pressure room with the intermediate cap; and

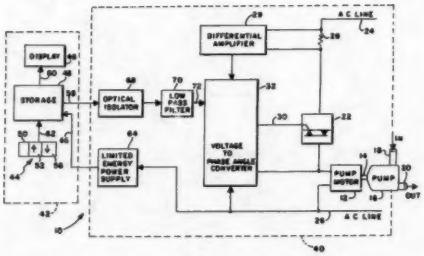
a left cap combined with the left side flange of the outer housing, defining a pumping room together with the sealing disc, said pumping room having the fan therein to rotate to push the liquid coming through an inlet in the left cap, then through the opening in the sealing disc into the liquid cooling room via the passage into the pumping room to flow out of an outlet in the left cap.

5,151,017

VARIABLE SPEED HYDROMASSAGE PUMP CONTROL

Lawrence Sears, Hunting Valley, and John T. Wall, Seven Hills, both of Ohio, assignors to ITT Corporation, New York, N.Y.

Filed May 15, 1991, Ser. No. 700,278
Int. Cl.[5] F04D *15/00*
U.S. Cl. 417—45 **23 Claims**



1. A control for a hydromassage pump motor for controlling the speed of the pump motor and a pump connected thereto to one of a plurality of predetermined preset speeds to thereby control the flow of water through the hydromassage pump comprising a low voltage user interface and a high voltage motor power control which is connected to, but electrically isolated from, said user interface, said low voltage user interface including storage means for storing therein a plurality of preset speeds, each of which is indicative of a desired pump motor speed, said storage means providing an output signal indicative of one of said plurality of said preset speeds, a first input means for energizing the pump motor at a speed indicated by said output signal of said storage means, second input means connected to said storage means for indexing the output signal of said storage means to the next sequential preset speed of said plurality of preset speeds, and display means responsive to said output signal of said storage means for usually displaying an indication of the speed of the pump motor, said high voltage power control including a solid state switch means adapted to be connected in series with the pump motor and a source of high voltage electrical energy to energize the pump motor when the solid state switch means is conductive, controller means for controlling the conduction of said solid state switch means and means including an opto-isolator for coupling said output signal from said storage means to said controller means to control the conduction of said switch means in dependence upon the output signal of said storage means.

5,151,018

SOUND ATTENUATION CHAMBER

Harry B. Clendenin, and James F. Fogt, both of Sidney, Ohio, assignors to Copeland Corporation, Sidney, Ohio

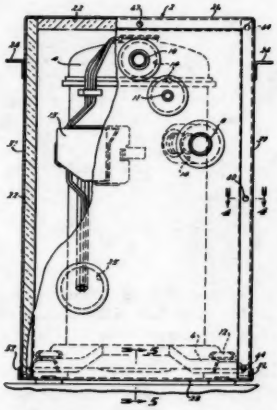
Filed Jul. 31, 1990, Ser. No. 560,104
Int. Cl.[5] F04B *39/00;* **G10K** *11/00*
U.S. Cl. 417—312 **8 Claims**

1. A sound attenuation enclosure for a heremetic refrigerant compressor having refrigerant conduits connected thereto, said enclosure comprising:

(a) a first relatively fixed section onto which the compressor

is adapted to be affixed, said first section having at least one aperture formed therein through which at least one refrigerant conduit passes;

(b) a second section attachable to said first section so that both said sections define a chamber which substantially encloses the compressor, said second section being detachable from said first section to permit access to the compressor; and



(c) means for attenuating the sound produced by the compressor comprising material having sound absorbing properties disposed in said chamber, said enclosure being shaped as a six-sided box, having a top, bottom, front, back and two sides wherein said second section is comprised of four integrally formed portions, one forming the top of said chamber and the remaining three forming two sides and the back of said chamber.

5,151,019

PUMPING DEVICE HAVING INLET AND OUTLET VALVES ADJACENT OPPOSED SIDES OF A TUBE DEFORMING DEVICE

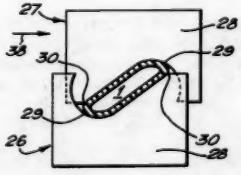
Hal C. Danby, Sudbury, and Eric A. Faulkner, Maidenhead, both of England, assignors to Danby Medical Engineering Ltd., Suffolk, England

Filed Nov. 2, 1989, Ser. No. 430,851

Claims priority, application United Kingdom, Nov. 4, 1988, 8825816

Int. Cl.[5] F04B *43/12*

U.S. Cl. 417—474 **34 Claims**



1. A pumping device comprising:

means for accommodating a length of tubing providing, in operation, passage for liquid through said device,

means for deforming said tubing whereby to reduce its volume, and

controllable valve means including independently controlled valve actuators provided adjacent opposed sides of said deforming means for restricting the flow of liquid through said tube,

wherein said deforming means comprises members arranged for controlled relative movement in opposed directions in parallel planes transverse to the direction of liquid passage within said tubing, said members adapted to engage said tubing between said actuators, whereby said tubing is first deformed in one transverse direction and then in the opposed transverse direction which tends to restore the original cross-sectional shape of said tubing, and

control means for controlling said value actuators to open and close in synchronism with deforming of said tubing so that liquid is displaced from an outlet side of said tubing as a function of change of volume of the tubing during deformation.

5,151,020

SCROLL TYPE COMPRESSOR HAVING GRADUALLY THINNED WALL THICKNESS

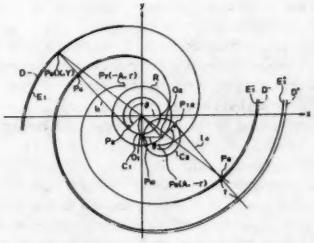
Tatsushi Mori; Hisao Kobayashi, and Yuji Izumi, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Aug. 15, 1991, Ser. No. 745,488

Claims priority, application Japan, Sep. 13, 1990, 2-245364

Int. Cl.[5] F04C *18/04*

U.S. Cl. 418—55.2 **4 Claims**



1. A scroll type compressor comprising a stationary scroll and a movable scroll, outer and inner walls of the movable scroll confronting those of the stationary scroll and being supported to be subjected to an orbital motion along an orbital circle while prevented from spinning around its own axis, a sealed space being formed between both the scrolls which is reduced in volume when the movable scroll is subjected to the orbital motion, profiles of walls of both scrolls being defined by a curve generated from a modification of an involute curve of a basic circle, characterized in that

the curve defining a profile of the outer wall (outer wall curve) is generated from a basic involute curve by reducing a certain value from a length of the respective involute line of the basic involute curve, which value is increased as the involute angle is developed; and

the curve defining a profile of the inner wall (inner wall curve) is generated from the outer wall curve by first transferring the respective point on the outer wall curve substantially in the normal direction to the outer wall curve at the respective point by a distance equal to a radius of the orbital circle to form an intermediate curve and then symmetrically transferring the respective point on the intermediate curve around the center of the basic circle;

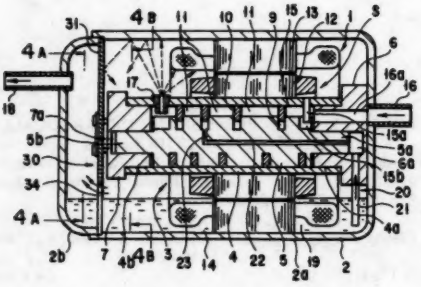
wherein the involute line is defined by a segment of tangent to the basic circle at the respective involute angle between the involute curve and the basic circle.

5,151,021

FLUID COMPRESSOR WITH ADJUSTABLE BEARING SUPPORT PLATE

Takayoshi Fujiwara, Kawasaki, and Hisanori Honma, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 30, 1992, Ser. No. 828,246
Claims priority, application Japan, Mar. 8, 1991, 3-43180
Int. Cl.[5] F04B 39/00
U.S. Cl. 418—93 14 Claims



1. A fluid compressor comprising:

a sealed casing at the bottom of which an oil reservoir for receiving a lubricating oil is formed;

suction means, connected to the sealed casing, for guiding a fluid to be compressed into the sealed casing, and exhaust means for exhausting the fluid compressed to a high pressure in the sealed casing;

a cylinder housed in the sealed casing and having first and second ends;

compression means including a columnar rotary body having at least one spiral groove and shaft portions at both ends, said rotary body being housed in the cylinder and arranged along the axis of the cylinder eccentrically to the axis of the cylinder such that the rotary body is rotatable relative to the cylinder with part of the outer periphery of the rotary body put in contact with the inner peripheral surface of the cylinder, and a spiral blade fitted in the spiral groove so as to freely project from and retreat in the groove in the radial direction of the rotary body, said blade having an outer peripheral surface put in contact with the inner peripheral surface of the cylinder, thereby partitioning the space between the inner peripheral surface of the cylinder and the outer periphery surface of the rotary body into a plurality of working chambers;

a suction passage for sucking the fluid from the suction means and supplying the fluid into a first one of the working chambers;

a discharge passage for discharging the compressed high-pressure fluid from the last one of the working chambers into the inside of the sealed casing;

a first bearing member inserted in an opening at said one end of the cylinder, and a second bearing member inserted in an opening at said second end of the cylinder, the second bearing member being situated closer to said exhaust means than the first bearing member, thereby rotatably supporting said cylinder and the shaft portions of the rotary body; and

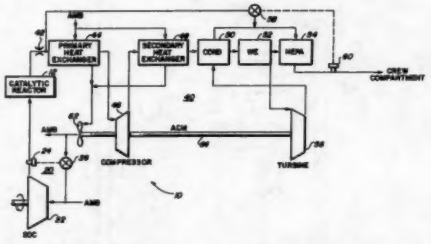
support means for supporting the second bearing member and preventing the lubricating oil mixed in the high-pressure fluid and dispersed from the discharge passage from reaching the exhaust means.

5,151,022

ENVIRONMENTAL CONTROL SYSTEM WITH CATALYTIC FILTER

Terence P. Emerson, Hermosa Beach; Frank A. Bescoby, Rancho Palos Verdes; Colin M. Taylor, Lakewood, all of Calif., and George K. Payne, Baldwin, Ga., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 3, 1991, Ser. No. 771,699
Int. Cl.[5] F24F 11/00
U.S. Cl. 423—245.3 19 Claims



1. An integrated environmental control system for providing conditioned air free of nuclear, biological, and chemical warfare agents to the crew compartment of a vehicle, comprising in combination:

a refrigeration unit;

a catalytic reactor filter upstream of said refrigeration unit and in fluid communication therewith; and

means for compressing ambient air and supplying said compressed air to said catalytic filter at a constant temperature regardless of the ambient temperature.

5,151,023

HEPATITIS A,B-COMBINED ADJUVANTED VACCINE

Syoji Kuzuhara, Houtaku; Koichi Odo, Kumamoto, and Kyosuke Mizuno, Kumamoto, all of Japan, assignors to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Japan

Filed Apr. 27, 1989, Ser. No. 344,911
Claims priority, application Japan, Apr. 28, 1988, 63-106748
Int. Cl.[5] A61K 39/12; C12N 7/00
U.S. Cl. 424—89 10 Claims

1. A hepatitis A,B-combined adjuvanted vaccine comprising an inactivated hepatitis A virus antigen, a hepatitis B virus surface antigen and an adjuvant, wherein said vaccine comprises at least 50 ng/ml of the inactivated hepatitis A virus antigen and at least 2.5 μg/ml of the hepatitis B virus surface antigen, said antigens being adsorbed from 100 to 1000 μg/ml of the adjuvant.

5,151,024

APPARATUS FOR STRETCHING DOUGH

Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Division of Ser. No. 547,655, Jul. 3, 1990. This application Dec. 6, 1990, Ser. No. 623,326
Int. Cl.[5] A21C 3/02; B29C 43/46, 43/58
U.S. Cl. 425—141 7 Claims

1. An apparatus for stretching dough comprising:

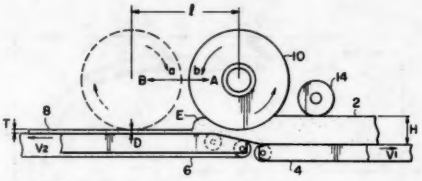
an upstream conveyor,

a downstream conveyor that is disposed serially with said upstream conveyor, the conveying speed of said downstream conveyor being higher than that of said upstream conveyor, said upstream conveyor and said downstream conveyor being aligned in a moving direction,

a single roller rotatable about its axis, and

means for reciprocating said single roller only over a prede-

termined distance (l) of said downstream conveyor, said single roller being reciprocated in the moving direction



and being spaced apart from the conveying surface of said downstream conveyor.

5,151,025

ELECTRICALLY HEATABLE NOZZLE FOR AN INJECTION MOLDING MACHINE, A HOT RUNNER SYSTEM OR THE LIKE

Walter Müller, Battenberg, Fed. Rep. of Germany, assignor to Ewikon Entwicklung und Konstruktion GmbH & Co. KG, Kirchlengern, Fed. Rep. of Germany

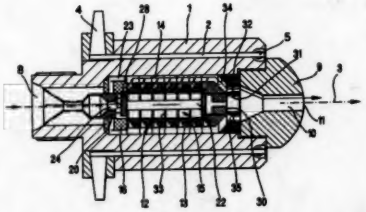
PCT No. PCT/DE90/00663, § 371 Date Aug. 16, 1991, § 102(e) Date Aug. 16, 1991, PCT Pub. No. WO91/06413, PCT Pub. Date May 16, 1991

PCT Filed Aug. 30, 1990, Ser. No. 691,029

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1989, 3935667

Int. Cl.[5] B29C *45/20*

U.S. Cl. 425—199 **35 Claims**



1. An apparatus for filtering flowable material, said apparatus comprising a nozzle, and said nozzle including a housing which defines a chamber, said housing having an inlet and an outlet for the flowable material, and said nozzle further including means for electrically heating said housing, and dividing means in said chamber for dividing said chamber into an inner compartment and an outer compartment surrounding said inner compartment, said dividing means including a strainer for the flowable material, and said nozzle also including a regulating member movable between a first position in which the flowable material entering said inlet is conducted into said inner compartment for flow through said strainer into said outer compartment and a second position in which flowable material entering said inlet is conducted into said outer compartment for flow through said strainer into said inner compartment, said strainer filtering the flowable material when the material is conducted into one of said compartments for flow through said strainer into the other of said compartments.

5,151,026

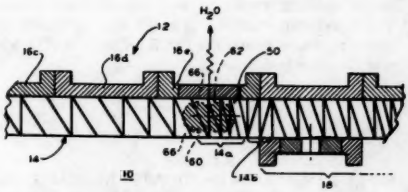
APPARATUS FOR REMOVING LIQUIDS FROM SOLIDS

Paul G. Andersen, Warwick, N.Y., and Kai L. Kite-Powell, Mahwah, N.J., assignors to Werner & Pfleiderer Corp., Ramsey, N.J.

Filed Oct. 31, 1990, Ser. No. 606,561

Int. Cl.[5] B29C *47/62*; B29B *7/84*

U.S. Cl. 425—204 **10 Claims**



1. Apparatus for removing a liquid from a mass of a material, wherein the apparatus comprises:

first means for transporting the liquid-containing material to and through a liquid-extraction location therewithin, the first means applying to the material in a first direction first transporting and working forces;

second means for applying to the material within or slightly downstream of the extraction location second transporting and working forces, the second forces being applied in a second direction generally opposite to the first direction, the simultaneous application of the first and second forces to the material tending to compact the material to extract therefrom the liquid contained therein;

a liquid exit path along with liquid extracted from the material exits the extraction location, the path extending away from the extraction location generally transversely of the first and second directions; and

third means for preventing the material from exiting along the path while permitting the liquid to so exit, the first, second, and third means forming a pinch point on the material within or slightly downstream of the liquid extraction location to substantially eliminate liquid flow countercurrent to said first direction.

5,151,027

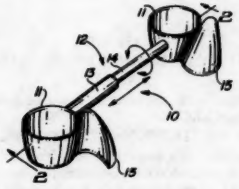
ORTHODONTIC DEVICE FOR SMALL ANIMALS

Lloyd J. Mann, 150 South Rossevelt, #3008, Mesa, Ariz. 85202

Filed Sep. 18, 1989, Ser. No. 408,774

Int. Cl.[5] A61D *5/00*

U.S. Cl. 433—1 **12 Claims**



1. An animal orthodontic fixture for the correction of displaced mandibular canine teeth comprising:

a bite plane for emplacement within an animal's mouth to make interfering contact with a displaced mandibular canine tooth of an animal for bucally moving said mandibular canine tooth to its proper functioning position within an animal's mouth;

tooth coupling means coupled to said bite plane, for coupling said bite plane in position within an animal's mouth

to make interfering contact between said bite plane and a displaced mandibular canine tooth of an animal;

torque resisting means coupled to said tooth coupling means for resisting stress moments generated by interfering contact made between a displaced mandibular canine tooth and said bite plane;

a second said bite plane and a second said tooth coupling means; and

said torque resisting means comprises a rod connecting said tooth coupling means to said second tooth coupling means, said rod extending lingually from each said tooth coupling means within the mouth of an animal in which said fixture is emplaced.

5,151,028

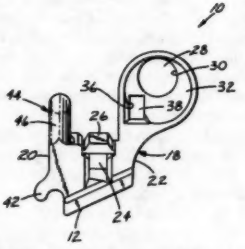
TRIPLE PASSAGE ORTHODONTIC BUCCAL TUBE

Wilford A. Snead, San Dimas, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 14, 1992, Ser. No. 835,880

Int. Cl.[5] A61C *3/00*

U.S. Cl. 433—17 **8 Claims**



1. An orthodontic buccal tube comprising:

a tooth-facing base;

a body extending from the base and having spaced apart occlusal and gingival side portions, said body including a first passage between said occlusal and gingival side portions for receiving a main arch wire, said body including a second passage and a third passage, said second passage and said third passage extending alongside said first passage, said second passage including an enlarged mesial entrance, said third passage including a mesial opening that is located at least partially in said enlarged entrance.

5,151,029

REMOVING PHYSIOLOGIC TISSUE FROM A TOOTH CANAL

Guy Levy, Tustin, Calif., assignor to Endo Technic Corporation, San Clemente, Calif.

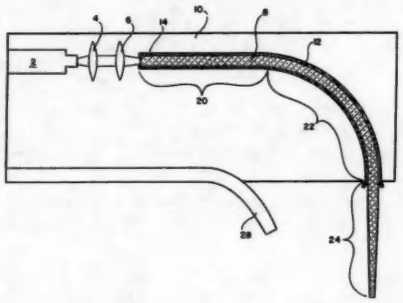
Division of Ser. No. 615,789, Nov. 20, 1990, Pat. No. 5,092,773, which is a continuation-in-part of Ser. No. 299,472, Jan. 19, 1989, Pat. No. 5,020,995, and a continuation-in-part of Ser. No. 351,203, May 15, 1989, which is a continuation-in-part of Ser. No. 335,245, Feb. 10, 1989, abandoned. This application Oct. 30, 1991, Ser. No. 784,975

Claims priority, application France, Dec. 21, 1988, 88 17549

Int. Cl.[5] A61C *1/00*

U.S. Cl. 433—29 **5 Claims**

1. In a device for removing physiologic tissue from a tooth canal by application to the tissue of laser radiation, which device includes a source of such laser radiation and an optical fiber having a proximal end disposed to receive the radiation and a distal end dimensioned to be insertable into the tooth canal, the improvement wherein said optical fiber is tapered in



a region adjacent said distal end such that the diameter of said fiber decreases in the direction toward said distal end.

5,151,030

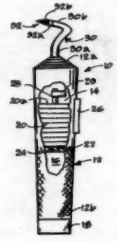
DENTAL FILLER APPLICATOR

Robert I. Comeaux, 12666 Brookshire Ave., Baton Rouge, La. 70815

Filed Jul. 12, 1991, Ser. No. 729,485

Int. Cl.[5] A61C *1/07*

U.S. Cl. 433—118 **13 Claims**



1. A tool for causing a filling material to fill a cavity of a tooth comprising:

a. hollow housing means for grasping by the hand of the user, said housing means having a top end and a bottom end,

b. vibrator means located in said housing means for vibrating said housing means,

c. a single brush for molding and shaping a filling material, the brush having a fiber tip connected to a rigid base, said fiber tip being adapted to hold filling material thereon, said fiber tip being sable hair, and

d. brush holder means connected to said top end of said housing means and to said brush for holding said rigid base of aid brush.

5,151,031

FILLING OR COATING MINERALIZED PHYSIOLOGIC TISSUE

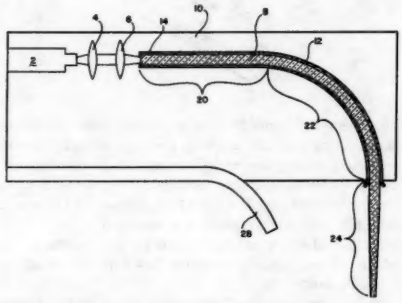
Guy Levy, Tustin, Calif., assignor to Endo Technic Corporation, San Clemente, Calif.

Division of Ser. No. 615,789, Nov. 20, 1990, Pat. No. 5,092,773, which is a continuation-in-part of Ser. No. 299,472, Jan. 19, 1989, Pat. No. 5,020,995, and a continuation-in-part of Ser. No. 351,203, May 15, 1989, which is a continuation-in-part of Ser. No. 335,245, Apr. 10, 1989, abandoned. This application Oct. 30, 1991, Ser. No. 784,977

Claims priority, application France, Dec. 21, 1988, 88 17549

Int. Cl.[5] A61C 5/04

U.S. Cl. 433—226 6 Claims



1. A method of filling or coating mineralized physiologic tissue, including tooth enamel and dentin and bone, with a calcium containing product capable of being bonded to a surface of the tissue, comprising: providing two starting components which when combined and exposed to light of a selected wavelength undergo a photochemical reaction to form the calcium containing product; projecting the components toward the surface; and causing light of the selected wavelength to impinge on the components at least partially before the components reach the surface in order to create the photochemical reaction and cause the resulting calcium containing product to bond to the tissue.

5,151,032

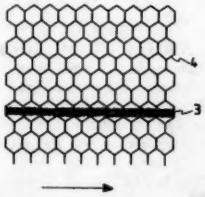
MAGNETOPHORETIC DISPLAY PANEL

Tatsuya Igawa, Kanagawa, Japan, assignor to Kabushiki Kaisha Pilot, Tokyo, Japan

Filed Jul. 12, 1990, Ser. No. 551,345

Int. Cl.[5] B43L 1/00

U.S. Cl. 434—409 20 Claims



1. A magnetophoretic display panel comprising; a pair of substrates, a plurality of cells sandwiched between said substrates, each of said cells filled with a liquid dispersion comprising magnetic particles, a dispersion medium, and a colorant;

at least 90 wt % of said magnetic particles have a particle size in the range of 10–150 μm;

said magnetic particles have an apparent density in the range of 0.5–1.6 g/cm^3; and

said magnetic particles have a saturation magnetization in the range of 40–150 emu/g.

5,151,033

ELECTRICAL CONNECTOR

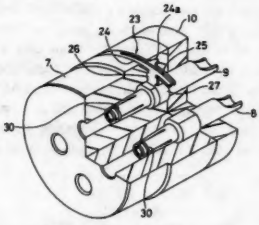
Mitsuru Kawai; Masaru Yoshida, and Yoshiro Sasaki, all of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1991, Ser. No. 739,421

Claims priority, application Japan, Sep. 13, 1990, 2-241291

Int. Cl.[5] H01R 4/66

U.S. Cl. 439—95 2 Claims



1. An electrical connector comprising:

a conductive shell having an inner stopper flange and an annular groove formed on an inside wall thereof;

an insulation housing placed within said conductive shell and having at least two terminal mounting apertures;

at least one detachable terminal mounted in one of said terminal mounting apertures;

a detachable ground terminal mounted in the other terminal mounting aperture;

a retention member for retaining said detachable terminal and said detachable ground terminal;

a conductive stopper ring set in said annular groove for cooperating with said inner stopper flange to hold said insulation housing and said retention member within said conductive shell; and

a detachable ground member attached to said ground terminal such that part of said ground member is brought into contact with said conductive stopper ring.

5,151,034

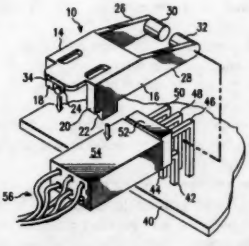
CONNECTOR RETAINER

Kirk R. Chandler, Garland, and Robert W. McKenzie, Lewisville, both of Tex., assignors to Alcatel Network Systems, Inc., Richardson, Tex.

Filed Oct. 7, 1991, Ser. No. 772,076

Int. Cl.[5] H01R 9/09

U.S. Cl. 439—79 6 Claims



1. Connector retainer apparatus for use with an electrical

connector slidably attached to a set of electrical right angle pins spaced apart by a distance D both directions from an apex of a right angle portion of said pins comprising, in combination:

U-shaped base means, including a bit portion and first and second legs, for enclosing a connector socket body having female portions slidably engaging a set of male right angle electrical connector pins nominally separated by a distance D;

snap action means, comprising a part of said legs of said base means, for positively engaging the connector body to prevent accidental removal therefrom;

third and fourth legs backwardly extending from said first and second legs respectively toward the right angle portion of said male connector pins and each having remote ends; and

first and second hinge pin means extending inwardly toward each other from the remote ends of said third and fourth legs respectively and each of said pin means having a diameter of at least 5% greater than said distance D for insertion in the right angle portion of said set of male right angle pins in the right angle portion thereof, the hinge pin means in the right angle portion acting to prevent movement of said base means in other than a rotational direction around said pin means in a hinge-type action.

5,151,035

ELECTRICAL CONNECTOR

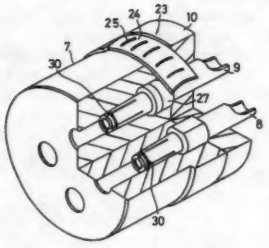
Mitsuru Kawai; Masaru Yoshida, and Yoshihiro Sasaki, all of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1991, Ser. No. 741,958

Claims priority, application Japan, Sep. 13, 1990, 2-95564[U]

Int. Cl.[5] H01R *4/66*

U.S. Cl. 439—95 **3 Claims**



1. An electrical connector comprising:

a conductive shell made from a conductive material;

an insulation housing placed within said conductive shell and having at least two terminal mounting apertures, at least two ground member mounting recesses formed on a side surface thereof, and at least two linkage channels formed on a rear surface thereof for linking said ground member mounting recesses to said terminal mounting apertures;

at least one detachable terminal mounted in one of said terminal mounting apertures;

a detachable ground terminal mounted in the other terminal mounting aperture;

a retainer member for retaining said detachable terminal and said detachable ground terminal in said insulation housing; and

a detachable ground member with a circular mount strap attached to said ground terminal and having a linkage piece held between said retainer member and one of said linkage channels of said insulation housing, thereby securing said ground member to one of said terminal apertures.

5,151,036

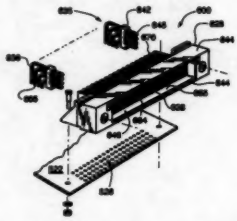
CONNECTORS WITH GROUND STRUCTURE

David F. Fusselman, Middletown, and Peter K. Townsend, Camp Hill, both of Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 536,855, Jun. 8, 1990, abandoned. This application Sep. 27, 1991, Ser. No. 766,930

Int. Cl.[5] H01R *4/66*

U.S. Cl. 439—108 **5 Claims**



1. An electrical connector for electrically and mechanically interconnecting a circuit assembly having a plurality of contact regions and a mating connector having first side walls, a plurality of first contact portions arranged in rows and columns within the first side walls and at least one second side contact portion, the electrical connector comprising:

a plurality of electrical contact elements wherein:

each of the contact elements has a first contact and a second contact,

the first contacts are arranged in rows and columns for contacting the first contact portions, and

each one of the contact elements includes a middle portion configured such that their second contacts extend at an angle with respect to the first contacts,

a housing including:

a conductive base having a plurality of passages arranged in rows and columns extending through the base, the contact elements positioned in the passages,

a plurality of insulative blocks positioned in the passages, the having passages, the contact elements being in the block passages such that their first contacts are on a first side of the base in a contact region and their second contacts are on a second side of the base, and

conductive baffles positioned between and spaced from columns of the middle portions of the contact elements, the baffles being connected to the conductive base.

5,151,037

TRANSPARENT CONTACT RAIL

Helmut Range, Lemgo, and Gerhard Beigel, Detmold, both of Fed. Rep. of Germany, assignors to Staff GmbH & Co. KG, Lemgo, Fed. Rep. of Germany

Filed Apr. 26, 1991, Ser. No. 691,847

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1990, 4013529

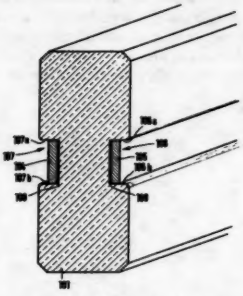
Int. Cl.[5] H01R *25/14*

U.S. Cl. 439—110 **10 Claims**

1. A contact rail for supporting at least one device insertable thereon to be in electrical contact with the contact rail, said contact rail comprising:

a transparent insulating support member having a rectangular cross section and two electrical conductors extending substantially along the length of said contact rail and

arranged in longitudinal grooves at opposite broadsides of the support member, such that the conductors can be



tapped from the outside at said two opposite sides, wherein said support member is made of glass.

5,151,038

ADAPTER FOR CONTACT RAILS

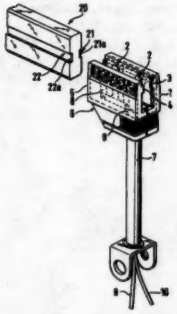
Helmut Range, Lemgo; Gerhard Beigel, Detmold; Friedemann Lotsch, Dortmund, and Peter Debie, Unna, all of Fed. Rep. of Germany, assignors to Staff GmbH & Co. KG, Lemgo, Fed. Rep. of Germany

Filed Apr. 26, 1991, Ser. No. 691,851

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1990, 4013863

Int. Cl.[5] H01R *25/14*

U.S. Cl. 439—122 **22 Claims**



11. An adapter for a contact rail having electrical conductors and grooves provided on opposite surfaces thereof, said adapter comprising:

a housing with two lateral legs forming a recess therebetween and each leg including an inside surface facing toward said recess, said legs being moveable away from and towards each other between an open and a closed position and adapted to be slidably and removably mounted to the contact rail placed in said recess;

at least two electrical contacts located in said recess of said housing, each said contact situated adjacent to a respective one of said legs, said electrical contacts facing said recess,

at least one holding element projecting from each said inside surface toward said recess,

wherein with said adapter in said closed position, said holding elements engage grooves on said contact rail and said electrical contacts touch electrical conductors arranged in said grooves.

5,151,039

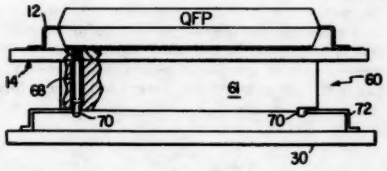
INTEGRATED CIRCUIT ADAPTER HAVING GULLWING-SHAPED LEADS

James V. Murphy, Warwick, R.I., assignor to Advanced Interconnections Corporation, West Warwick, R.I.

Continuation-in-part of Ser. No. 505,733, Apr. 6, 1990, abandoned. This application Apr. 29, 1991, Ser. No. 693,446

Int. Cl.[5] H05K *1/00*

U.S. Cl. 439—70 **32 Claims**



1. An adapter for removably electrically connecting the device leads of an electronic device to a circuit surface on which there are contacts arranged in a pattern having four rows of contacts, one row on each side of a rectangular pattern, the device leads of the electronic device being disposed in essentially the same rectangular pattern as that of the contacts on the circuit surface, said adapter comprising:

an insulative body bearing electrical attachment sites configured for making electrical connections with said device leads of the electronic device;

a plurality of adapter leads formed from lead frame portions, each said adapter lead extending outwardly from said body and bending downwardly below said body and then further outwardly in a pair of opposing curves to form a foot, said adapter leads together forming feet located in a pattern that matches both said contacts on said circuit surface and the device leads of the electronic device; and

a plurality of terminal elements supported by said body and electrically connecting said adapter leads to said electrical attachment sites,

said terminal elements being disposed such that each said terminal element lies substantially directly under the electronic device.

5,151,040

ELECTRICAL CONNECTOR FOR REPEATED CONNECTION TO INTEGRATED CIRCUIT GRID ARRAY DEVICES

Mitsuho Tanaka, Tama, Japan, assignor to Kel Corporation, Tokyo, Japan

Filed Apr. 26, 1991, Ser. No. 693,231

Claims priority, application Japan, Apr. 27, 1990, 2-112769

Int. Cl.[5] H05K *1/00*

U.S. Cl. 439—73 **16 Claims**

1. An electrical connector for repeated connection to integrated circuit devices of the kind having an array of individual contacts on a contact face thereof, and comprising:

an insulating housing body having an upper, contact face and a lower face for connection to an external circuit;

a corresponding array of individual terminals anchored in the housing and each comprising a tubular receptacle portion having a mouth at the contact face and a male terminal portion extending axially therefrom and protruding from the lower face;

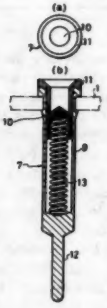
a contact member mounted in each receptacle portion for axial sliding movement therein towards and away from the mouth;

springs in respective receptacle portions in biassing engagement with the respective contact members to urge the contact members axially upwardly towards the contact face so that engagement of respective contacts with upper ends of respective members with an axial downward

contact force depresses the respective contact members against the action of the spring axially further into the receptacle to establish electrical connection therebetween, and, disengagement, of the contacts and contact members permits the spring to restore the respective contact members towards the upper face;

the housing body being molded from one piece of plastic material with front and rear ends and opposite sides extending between the ends, locking projections extending laterally from opposite sides at the front end and ears upstanding from opposite sides at the rear end, identical apertures being formed in respective ears, each aperture having an enlarged pivotal portion communicating forwardly with a slot-form locking portion; and

a one-piece cover member of generally U-shape having a pair of resilient arms extending rearwardly from a forward



transverse wall, flanges depending from opposite ends of the transverse wall and having forwardly opening locking pin receiving slots, forward, free ends of the arms having depending portions and tabs extending laterally outwardly therefrom, the cover member being mountable on the housing body by receipt of the respective tabs in respective enlarged portions of respective apertures, admitted therein by resilient flexure together of the free ends of the arms and the cover member being moveable between open, device receiving, and closed, device retaining positions, by pivotal movement of the front end between positions remote and adjacent the contact face, respectively, and subsequent forward movement of the cover member to bring the locking slots into registration with respective locking pins and the tabs into registration with the locking slots of the base member.

5,151,041

DEVICE FOR CONNECTING AND DISCONNECTING FIRST AND SECOND ELECTRICAL CONNECTOR PARTS

Lutz Kaiser, Herrenberg; Eugen Kimmerle, Holzgerlingen; Erich Mirbach, Sindelfingen, and Frank Notter, Nufringen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 22, 1991, Ser. No. 781,570

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1990, 4042060

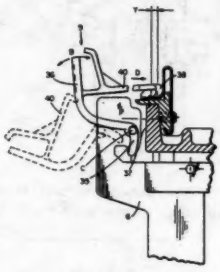
Int. Cl.[5] H01R *13/00*

U.S. Cl. 439—157 **9 Claims**

1. A device for connecting and disconnecting a first movable connector part from a fixedly positioned second connector part within a housing, said first movable connector part being guided within said housing and adapted for being moved in a first direction toward said housing in response to a predetermined insertion force until said first movable connector part and said fixedly positioned second connector part are connected, said device comprising:

at least two movable latches separately supported at spaced apart locations on said first movable connector part; and

at least two movable catch members separately positioned at spaced apart locations on said housing so that each of said latches is functionally associated with a respective one of said catch members, each of said catch members including an inflexible catch element and a flexible catch element positioned on said inflexible catch element and adapted for



engaging a respective one of said movable latches, said flexible catch element including a cam member for engaging said latch, said cam member movable in a direction away from said housing in a direction substantially opposite said first direction of said first movable connector part after said first and second connector parts are connected to thereby substantially reduce the force on said connected first and second connector parts.

5,151,042

ROTARY CONNECTOR

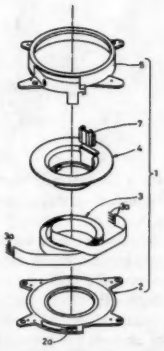
Tetsuya Okada, Tokyo, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1991, Ser. No. 767,020

Claims priority, application Japan, Oct. 2, 1990, 2-103833[U]

Int. Cl.[5] H01R *39/02*

U.S. Cl. 439—169 **5 Claims**



1. In a rotary connector including a fixed case and a rotatable case, each case having an opening for connection with at least one lead wire; a flat cable spirally wound and housed in the fixed and rotatable cases, the flat cable having a plurality of electrical conductors; and a connection terminal having one end connected to the electrical conductors of the flat cable and another end connected to the at least one lead wire and arranged at the opening of the rotatable case; the flat cable being arranged in said cases so as to loosen and tighten to thereby permit the rotatable case to rotate relatively to the fixed case,

the improvement comprising:

a fixing member attached to the at least one lead wire; and

a retaining member arranged at the opening of the rotatable case for engagement with the fixing member, the retaining member having a retaining portion for holding the at least one lead wire in a predetermined position relative to the connection terminal; and

the fixing member having a clamping tab for holding the at least one lead wire and engaging with the retaining portion of the retaining member, and an engaging tab engaged with the retaining member for resisting a tensile force acting on the at least one lead wire.

5,151,043

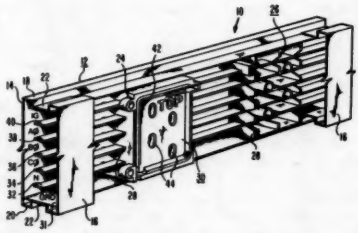
ELECTRICAL POWER DISTRIBUTION BUSWAY WITH ISOLATED GROUND BUS

Robert W. Morgan, Spartanburg, S.C., assignor to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Continuation of Ser. No. 288,530, Dec. 22, 1988, abandoned. This application Mar. 30, 1990, Ser. No. 504,094

Int. Cl.[5] H01R *25/16, 13/648*

U.S. Cl. 439—212 **19 Claims**



1. A power distribution system, comprising:

a service entrance connectable to a source of electrical power;

first electrical equipment capable of introducing a power surge into the system;

second electrical equipment which is sensitive to a power surge; and

a busway that transmits electrical power from the service entrance to the first and second equipment, which busway include a conductive housing, a first busbar connected to a first power phase conductor of the service entrance, a second busbar connected to a second power phase conductor of the service entrance, a third busbar connected to a third power phase conductor of the service entrance, a fourth, neutral bushbar connected to a neutral conductor of the service entrance, a fifth, ground busbar connected to ground at the service entrance, electrically insulating spacers mounted within the housing, which spacers support the first through fifth busbars in a spaced-apart, generally parallel relationship inside the housing, whereby the ground busbar is isolated from the conductive housing of the busway, a ground conductor connected to the housing and to ground at the service entrance and electrically isolated from the isolated ground busbar within the housing, and electrical connections which connect the first and second electrical equipment to the busway, whereby the first equipment is connected to first through fourth busbars and to the ground conductor, and whereby the second, surge-sensitive equipment is connected to the first through fifth busbars and is free of contact with the ground conductor.

5,151,044

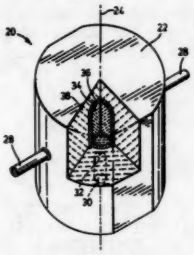
BLANKS FOR THE MANUFACTURE OF ARTIFICIAL TEETH AND CROWNS

Henri L. Rotsaert, 42 Brentwood Drive, Dundas, Ontario, Canada L8T 3V8

Continuation of Ser. No. 511,500, Apr. 20, 1990, abandoned, which is a division of Ser. No. 350,964, May 12, 1989, Pat. No. 4,970,032. This application May 22, 1991, Ser. No. 704,582

Int. Cl.[5] A61C *2/00*

U.S. Cl. 433—229 **23 Claims**



1. A blank for the manufacture therefrom of a single artificial tooth of a desired color by the removal of material from the blank, the blank comprising:

a core portion having lingual, labial, mesial, distal gingival and occlusal sides, the core portion approximating in shape at least at its libial, mesial and distal sides to the shape to a corresponding core portion of a single tooth to be manufactured therefrom;

reference means on the blank establishing a reference point from which the removal of material from the blank can be determined;

a first layer of another material overlaying at least the occlusal, labial, mesial and distal surfaces of the said core portion,

a second layer of a further material overlaying at least the occlusal, labial, mesial and distal surfaces of the first layer;

the thickness of the said first and second layers and the distributions of the their respective thicknesses over at least the said labial, mesial and distal sides cooperating together, and the materials of the said core portion and of the first and second layers cooperating together, to provide at least at the labial, mesial and distal surfaces the required color for the tooth upon selective removal of material of the first and second layers from the blank to leave a single tooth-shaped artificial tooth.

5,151,045

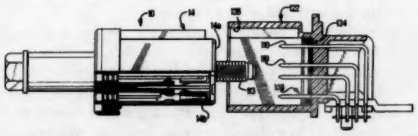
SEALS FOR AN ELECTRICAL CONNECTOR

David M. Cravens, Etters; Keith R. Denlinger, Lancaster; Richard W. Gryzbowski, Lebanon, and John M. Myer, Millersville, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 751,366, Aug. 28, 1991, abandoned. This application Apr. 13, 1992, Ser. No. 870,200

Int. Cl.[5] H01R *13/432*

U.S. Cl. 439—271 **10 Claims**



1. Seals for use in an electrical connector comprising a receptacle and a pin header, said seals comprising:

a first seal for use in a rear end of a receptacle in conjunction with an end cap having arranged, inwardly projecting ribs, said first seal having a body portion with grooves therein arranged to receive said ribs when said end cap is oriented in a pre-determined position; and

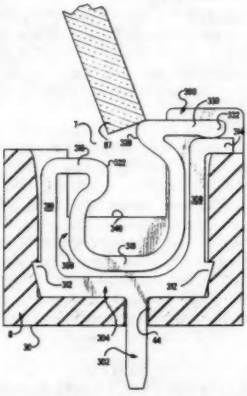
a second seal having a body portion and a rim portion extending normally outwardly from edges of said body portion, said rim portion having first and second inwardly facing surfaces and a outwardly facing mating surface, said second seal adapted for use in a cavity in a pin header with said mating surface adapted to be compressingly received by an edge of a receptacle inserted into said cavity whereupon said second surface bulges out into a space defined by said body and rim portions.

5,151,046

ELECTRICAL TERMINAL WHICH HAS OVERSTRESS PROTECTION

Iosif Korsunky, Harrisburg, and Dimitry G. Grabbe, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 27, 1991, Ser. No. 766,869
Int. Cl.[5] H01R *13/08*
U.S. Cl. 439—326 **20 Claims**



1. An electrical contact for connecting contact pads of a first printed circuit board to contact areas of a second printed circuit board, the contact comprising:

a base;

a post for making electrical connection with the contact areas of the second printed circuit board, the post extends from the base;

a contact section extending from the base, the contact section has first and second contact surface which are provided to make electrical connection with the contact pads of the first printed circuit board;

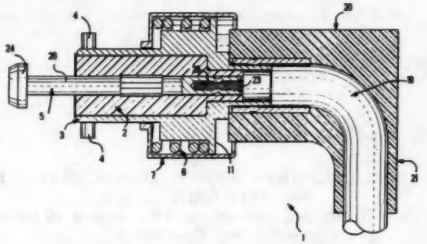
a bight member provided proximate the second contact surface, an overstress member extending from the base to proximate the bight member, the bight member and the overstress member are provided in frictional engagement whereby as the first printed circuit board is rotated from a first position to a second position the bight member cooperates with the overstress member to prevent the deformation of the contact section beyond its elastic limit.

5,151,047

CONNECTOR FOR CONNECTON TO A CELLUAR TELEPHONE

Michael J. Phillips, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 8, 1991, Ser. No. 742,772
Int. Cl.[5] H01R *4/50*
U.S. Cl. 439—333 **6 Claims**



1. An electrical connector for connection to an antenna mount of a cellular telephone, comprising:

a dielectric body,

a conductive shell concentrically encircling said dielectric body and provided with projecting bayonet coupling prongs for connection to an antenna mount of a cellular telephone,

a conductive center contact having a stem concentrically surrounded by said dielectric body and projecting outwardly from said dielectric body and said shell,

said stem having a front end for receipt in an electrical receptacle of a cellular telephone,

said stem having a wire connection portion for connection to a signal carrying conductor of a coaxial cable,

said stem being moveable to project said stem outwardly from said dielectric body, and to retract said wire connection portion into said dielectric body after connection of said wire connection portion to a signal carrying conductor of a coaxial cable,

anchoring means for anchoring said shell to said coaxial cable after retraction of said wire connecting portion into said shell,

a coil spring encircling said shell, and

a ring retainer encircling said coil spring and being adapted to impinge an antenna mount of a cellular telephone, said coil spring being compressible between said retainer and an outer flange of the shell when said bayonet prongs are connected to said antenna mount.

5,151,048

FAILSAFE ELECTRICAL CONNECTOR

Kensaku Sato, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1991, Ser. No. 712,910
Claims priority, application Japan, Jul. 27, 1990, 2-197725
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—357 **1 Claim**

1. A failsafe electrical connector comprising:

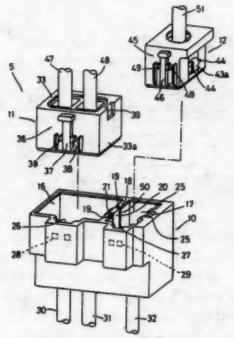
an electrical connector plug including a main signal plug portion with a contact terminal mounted therein, a check signal plug portion with a contact terminal mounted therein, and a partition wall provided between said main signal plug portion and said check signal plug portion;

a main signal socket having a side wall with an engaging recess and a contact terminal for coming into contact with said contact terminal of said main signal plug portion when said main signal socket is fitted in said main signal plug portion;

a check signal socket having a contact terminal for coming into contact with said contact terminal of said check signal

plug portion when said check signal socket is fitted in said check signal plug portion; and

block means provided on said partition wall in the form of a flexible block arm and having a projection toward said main signal plug portion so that when a connection of said main signal socket into said main signal plug portion is



complete, said recess engages said projection of said flexible block arm to permit insertion of said check signal socket into said check signal plug portion while if the connection is incomplete, said side wall flexes said block arm toward said check signal plug portion to thereby prevent insertion of said check signal socket into said check signal plug portion.

5,151,049

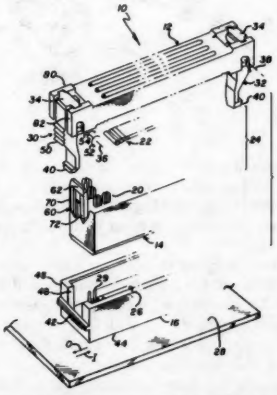
CONNECTOR LATCHING ARRANGEMENT

Rene A. Mosquera, Laguna Niguel, Calif., assignor to ITT Corporation, Secaucus, N.J.

Filed Jul. 11, 1991, Ser. No. 728,410

Int. Cl.[5] H01R *13/627*

U.S. Cl. 439—353 **10 Claims**



1. An electrical connector apparatus which includes a connector, a cover which is releasably held over said connector, and a latch pivotally mounted about a pivot axis on said cover, said latch having a latch block and said connector having a strike which is engaged by said latch block to prevent separation of said cover and connector, said latch being pivotable in a second direction to a position of maximum engagement with said strike and being pivotable in a first direction to disengage from said strike and allow separation of said cover and connector, said cover having a pair of spaced latch support brackets which pivotally support said latch, characterized by:

said latch support brackets which pivotally support said latch, are resiliently deflectable slightly together and apart;

of said brackets and latch, one of them has a slot extending largely radially to said axis with said slot having a pair of slot sides, and the other of them has a rib lying partially in the slot and having a pair of rib sides, with at least one of said sides being inclined so it is angled a plurality of degrees but less than 90° from parallelism with said pivot axis, so as said latch pivots in said first direction to release from said strike, said inclined side urges said support brackets to deflect apart to thereby provide a spring force urging said latch to pivot opposite to said first direction, said rib is wide enough and lies close enough to said pivot axis that at least part of said rib remains in said slot during pivoting of said latch from a position where said latch is in said position of maximum engagement to a position where said latch first disengages from said strike and allows separation of said cover and connector.

5,151,050

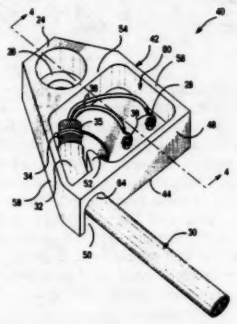
CABLE ASSEMBLY

James P. Scholz, Mechanicsburg, and Daniel E. Stahl, Dauphin, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 30, 1991, Ser. No. 768,125

Int. Cl.[5] H01R *13/58*

U.S. Cl. 439—456 **2 Claims**



1. A cable assembly comprising:

a one piece housing including a base having opposed front and rear walls and opposed first and second side walls extending upwardly from said base, said sidewalls extending between said front and rear walls, inner surfaces of said base and walls together defining a cable terminating cavity, at least one of said sidewalls extending at an oblique angle between said front and rear walls, said front wall of said housing further including a cable receiving opening extending therethrough and in communication with said cable terminating cavity, said front wall further including an inwardly directed peninsula shaped protrusion extending a selected distance into said cable receiving cavity, said protrusion being spaced from said obliquely extending sidewall such that said cable receiving opening is positioned between said protrusion and said obliquely extending sidewall, said protrusion and said obliquely extending sidewall defining a cable receiving channel therebetween;

a plurality of terminal members disposed in said housing and having first connecting portions extending into said cable terminating cavity;

an electrical cable having an insulating cover surrounding a plurality of discrete conductors, said cover having an end extending through said cable receiving opening and along

said cable channel and about said protrusion to be displaced within said cable terminating cavity, each of said conductors extending from said cover end and terminated to a respective one of said terminal members; and

potting materials disposed in and filling remaining portions of said cable terminating cavity, whereby

wall of said cable-receiving opening completely surround said cable, and said elongated cable receiving channel provide means for relieving strain on said cable when stress is applied thereto irrespective of said potting material bonding to said insulating cover surface, and further provide means for directing a desired exit path for said cable.

5,151,051

CONNECTOR LATCH WITH ANTI-OVERSTRESS

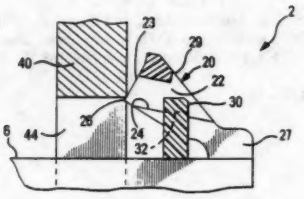
Akira Nagamine, Kawasaki, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 14, 1992, Ser. No. 835,788

Claims priority, application Japan, Feb. 28, 1991, 3-16512[U]

Int. Cl.[5] H01R *13/74*

U.S. Cl. 439—557 **8 Claims**



1. An electrical connector housing of a type intended to be mounted in the aperture of a panel including a body of resilient plastic material, at least one latch integrally formed with the material of the housing to include a flexible hinge supporting an ear having a surface engaging the panel to latch the housing thereto, the hinge being elastically deflected to facilitate insertion of the housing as pushed through the aperture of the panel, characterized in that said latch includes an interior recess having an interior surface and the housing includes an integral stop residing within said interior recess and positioned to engage the surface and limit bending deflection of the said latch responsive to forces pulling said housing out of said aperture.

5,151,052

MICROPIN CONNECTOR SYSTEM

Willard B. McCardell, Rochester Hills, Mich., assignor to Cardell Corporation, Rochester Hills, Mich.

Division of Ser. No. 767,636, Sep. 30, 1991, which is a division of Ser. No. 670,751, Mar. 15, 1991, Pat. No. 5,100,346. This application Feb. 11, 1992, Ser. No. 833,761

Int. Cl.[5] H01R *13/42*

U.S. Cl. 439—598 **30 Claims**

1. An electrical connector system, comprising:

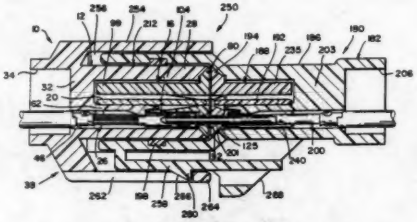
a socket connector component;

a plug connector component;

said socket and plug connector components each including a first unitary element having a plurality of elongated parallel locking fingers and a second unitary element having a plurality of elongated, parallel spacer fingers, said locking fingers and said spacer fingers being interdigitated to define a plurality of terminal receiver channels within each of the respective components;

a first plurality of electrical wires each having a socket terminal, said socket terminals being located in corresponding terminal receiver channels within said socket connector component and secured therein by latching engagement with corresponding interdigitated locking fingers, adjacent socket terminals being electrically isolated from each other by corresponding interdigitated spacer fingers; and

a second plurality of electrical wires each having a pin terminal, said pin terminals being located in corresponding



terminal receiver channels within said plug connector component and secured therein by latching engagement with corresponding interdigitated locking fingers, adjacent pin terminals being electrically isolated from each other by interdigitated spacer fingers.

5,151,053

ELECTRICAL CONNECTOR FOR SHIELDING CABLE

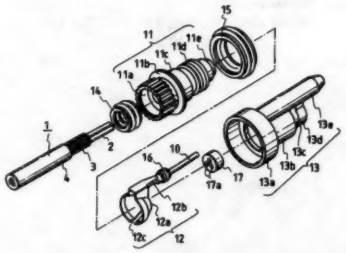
Yasuhisa Shinji; Toshiaki Hasegawa; Shinichi Akune, and Hirohiko Sakuhara, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Feb. 28, 1991, Ser. No. 661,974

Claims priority, application Japan, Mar. 5, 1990, 2-21476[U]; Aug. 30, 1990, 2-90067[U]

Int. Cl.[5] H01R *9/03*

U.S. Cl. 439—610 **2 Claims**



1. An electrical connector for use at an end of a shielding cable having insulatingly-covered inner wires, an electrically-conductive braid wire covering said inner wires, and an outer insulating layer covering said braid wire, said connector comprising:

a tubular body adapted to fit on said outer insulating layer;

a tubular terminal, having a body portion and a connection portion, for connection to an external electric wire, said body portion cooperating with said tubular body to hold said braid wire, folded back at an end of said outer insulating layer, therebetween in such a manner that said folded braid wire is disposed in pressure contact with said body portion and said tubular body; and

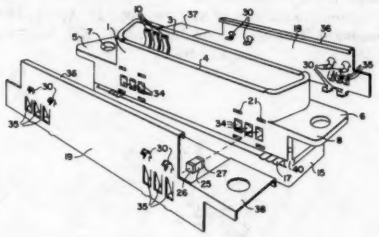
a tubular casing receiving and retaining said tubular body and said tubular terminal wherein said tubular body includes a flange portion, a cylindrical portion, a threaded portion, and a tapered surface, arranged sequentially and said tubular terminal includes a tapered annular body portion corresponding to said tapered surface, and a wire connection portion extending from said tapered annular body portion.

5,151,054

ELECTRICAL CONNECTOR SHELL AND GROUNDING SPRING THEREFOR

Francisco R. Briones, Markham, and Kamal S. Boutros, Downsview, both of Canada, assignors to Amphenol Corporation, Wallingford, Conn.

Filed May 22, 1991, Ser. No. 704,117
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 14 Claims



1. An electrical connector, comprising:

a dielectric housing having an exterior surface;

electrical contact means including an electrical contact provided in a passage through said housing for electrically connecting a first conductor external to said connector with a second conductor external to said connector;

cavity defining means for defining a cavity in communication with said passage and having an opening in communication with the exterior of said housing;

filter means including a filter element positioned in said cavity for electrically connecting said contact to ground;

biasing means including an electrically conductive grounding spring having an integral finger which extends into said cavity from the exterior thereof to bias said filter element in a direction of engaging said electrical contact;

housing flange means on said housing for securing said housing to a device containing said first conductor;

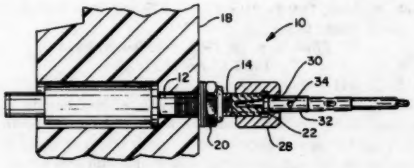
grounding spring flange means integrally formed as a part of said grounding spring for providing a direct uninterrupted electrical path from said filter element to ground upon being sandwiched between said housing flange means and a device to which the electrical connector is mated.

5,151,055

SELF LOCKING ELECTRICAL CONTACT

Anthony W. Lumbis, Watertown, N.Y., assignor to Knorr Brake Holding Corporation, Westminster, Md.

Continuation of Ser. No. 402,731, Sep. 5, 1989, abandoned. This application Oct. 17, 1991, Ser. No. 776,883
Int. Cl.[5] H01R *13/621*
U.S. Cl. 439—784 16 Claims



1. An electrical connector which comprises:

a first elongated connecting element and a second elongated connecting element, said first elongated connecting element having a threaded surface along the exterior thereof, said second elongated connecting element having a shoulder thereon;

a compression nut extending around and against said shoulder of said second connecting element and engaging said first connecting element to force positive engagement between said first and second connecting elements; and

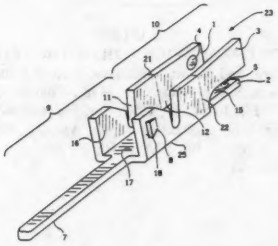
selection means for selectively allowing and preventing axial movement of said compression nut relative to said second elongated connecting element past a predetermined axial point on said second elongated connecting element without movement of a conductor mounted to said second elongated connecting element relative to said second elongated connecting element whereby said first and second elongated connecting elements are separated when said compression nut is disengaged from said first connecting element and said selection means prevents said axial movement.

5,151,056

ELECTRICAL CONTACT SYSTEM WITH CANTILEVER MATING BEAMS

Donald W. McClune, Hollidaysburg, Pa., assignor to Elco Corporation, Huntingdon, Pa.

Filed Mar. 29, 1991, Ser. No. 677,778
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—851 7 Claims



1. An unitary electrical socket contact for receiving an electrical contact pin, comprising:

a. an elongated, generally U-shaped contact body formed of electrically conductive material;

b. a mating region for receiving the contact pin, having two independent opposed cantilevered contact beams spaced apart by a spacing contact beam, (1) each contact beam attached to the contact body and extending to a pin-receiving end, (2) each contact beam having an embossment adjacent the pin-receiving end and projecting inwardly towards the axis of the contact body, so that constant frictional forces are exhibited on the contact pin by the embossments upon pin insertion, and (3) the opposed cantilevered contact beams being biased inwardly toward the axis of the contact body and the pin-receiving ends of the cantilevered contact beams being biased towards each other, so that a reliable mechanical and electrical contact is maintained on the contact pin due to the compressional and torsional forces produced on the contact pin by the opposed cantilevered contact beams upon pin insertion and;

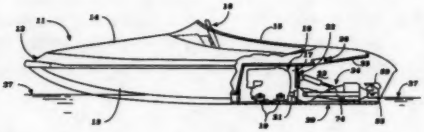
c. a retention means, attached to the contact body and extending from the mating region, for retaining the contact body in an insulating device.

5,151,057

WATER JET PROPULSION BOAT

Noboru Kobayashi, and Yoshiki Futaki, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 4, 1991, Ser. No. 680,709
Claims priority, application Japan, Apr. 4, 1990, 2-90636; Apr. 26, 1990, 2-113555
Int. Cl.[5] B63H *11/00*
U.S. Cl. 440—38 62 Claims



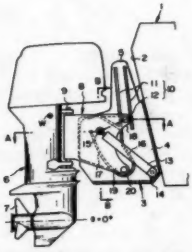
1. A water jet propelled boat comprised of a hull, a jet propulsion unit having an outer housing comprised of a water inlet portion having a water inlet opening, an impeller portion containing an impeller for drawing water through said water inlet portion from a body of water in which said boat is operating and a discharge nozzle portion for discharging water from said water inlet portion for propelling said boat, at least said water inlet portion being rotatable relative to another of said portions about an axis for raising said water inlet opening from a downwardly facing position to an elevated position when the boat remains in the body of water, and means for supporting said discharge nozzle portion against rotation relative to said hull when said water inlet portion is rotated between its positions.

5,151,058

SUPPORTING DEVICE FOR OUTBOARD MOTOR

Hideo Tahara, and Nobuo Makihara, both of Kanagawa, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 17, 1991, Ser. No. 686,449
Claims priority, application Japan, Apr. 20, 1990, 2-104750
Int. Cl.[5] B63H *21/26*
U.S. Cl. 440—61 6 Claims



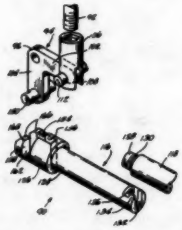
1. A supporting device for an outboard motor, wherein the outboard motor is mounted to a transom of a hull, comprising;
a first bracket mounted to the transom;
a thrust rail mounted to said first bracket;
a reverse rail mounted to said first bracket, said reverse rail being arranged opposite said thrust rail;
a second bracket having one end supporting the outboard motor, and the other end including one portion;
a thrust roller rotatably mounted to said one portion of said second bracket and being engagable with said thrust rail and said reverse rail;
means for allowing said second bracket to slidably and rotatable move relative to said first bracket, said allowing means being formed on said first bracket and including a pair of guide rails and a guide roller, said pair of guide rails being arranged in parallel; and
means for driving said second bracket, said driving means having one end connected to the hull and the other end connected to said second bracket.

5,151,059

SHIFTABLE REVERSING TRANSMISSION FOR MARINE PROPULSION DEVICE

Jeffrey P. Higby, Wildwood, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 506,622, Apr. 9, 1990, abandoned. This application Jun. 4, 1991, Ser. No. 710,163
Int. Cl.[5] B63H *21/28*
U.S. Cl. 440—75 66 Claims



1. A marine propulsion device comprising a lower unit including a gearcase, a propeller shaft mounted in said gearcase for rotation about a generally horizontal fore and aft axis and having an axially extending forwardly opening bore, a shift shaft including a rearward portion located in said bore, a forward portion, and means for connecting said forward portion to said rearward portion to effect common axial movement of said forward and rearward portions in both directions along said fore and aft axis, a shift lever supported by said lower unit for rotary movement about a horizontal axis transverse to said fore and aft axis, being adapted to be connected to a vertically shiftable link to thereby rock said lever about said transverse horizontal axis, and including a leg, and means for connecting said leg to said forward portion of said shift shaft to effect movement of said forward portion of said shift shaft in both directions along said fore and aft axis in response to rotary shift lever movement, one of said means for connecting said forward portion to said rearward portion and said means for connecting said leg to said forward portion including assembling means operable incident to forward displacement of said rearward portion of said shift shaft to effect such connection thereof so as thereafter to effect displacement of said shift shaft in both directions along said fore and aft axis in response to rocking movement of said shift lever about said transverse horizontal axis.

5,151,060

SWIMMING FLIPPER

Sek W. Lam, G.P.O. Box 13770, General Post Office, Hong Kong, Hong Kong

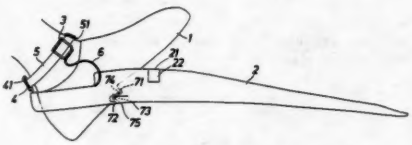
Filed Mar. 26, 1991, Ser. No. 674,934
Int. Cl.[5] A63B *31/11*
U.S. Cl. 441—62 4 Claims

1. A swimming flipper comprising a shoe having a heel portion, a fin, and hinge means for connecting said fin to said shoe rendering said shoe to rotate with respect to said fin,
wherein said fin comprises a front portion and a rear heel surrounding portion in which an opening having an area larger than that of said heel portion is provided, said swimming flipper further comprises:
two upwardly protruding and symmetrically disposed pro-

truding strips, each being provided on one side of said fin front portion,

a strap orienting member being provided at the end of the heel surrounding portion of the fin with the upper end of the strap orienting member extending upwardly and having an opening through which a strap is passed,

said strap being connected to the heel surrounding portion, and



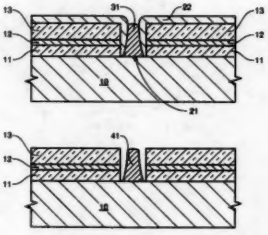
two buckles being provided on said strap and adapted to engage with or detach from the two protruding strips respectively, the strap, when detached, is adapted to be fastened against the portion between the lower end of the calf and the instep of the feet by means of an adjustable buckle provided on the strap.

5,151,061

METHOD TO FORM SELF-ALIGNED TIPS FOR FLAT PANEL DISPLAYS

Gurtej S. Sandhu, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Feb. 21, 1992, Ser. No. 839,606
Int. Cl.[5] H01J *9/02*
U.S. Cl. 445—24 **42 Claims**



1. A process for forming conductive self-aligned emission cathode tips on a starting substrate for use in flat panel displays, said process comprising the steps of:

a) forming a first dielectric layer superjacent and coextensive said starting substrate;

b) placing and patterning a first conductive layer superjacent and coextensive said first dielectric layer, said patterning of said first conductive layer resulting in a conductive grid structure having a plurality of a first set of parallel conductive lines in intersection with a plurality of a second set of parallel conductive lines and a plurality of exposed portions of said first dielectric layer;

c) forming a second dielectric layer superjacent and coextensive said conductive grid structure and exposed portions of said first dielectric layer;

d) etching a buried contact opening at each grid intersection thereby exposing portions of said starting substrate, and forming patterned edges in each layer bordering each said contact opening;

e) forming a sacrificial layer superjacent and coextensive said second dielectric layer and the patterned edges of said second dielectric layer, said first conductive layer and said first dielectric layer thereby forming cone-shaped voids at said exposed portions of said starting substrate;

f) placing a second conductive layer into said cone-shaped voids thereby connecting to said exposed portions of said starting substrate;

g) removing said sacrificial layer thereby forming said self-aligned cathode emission tips; and

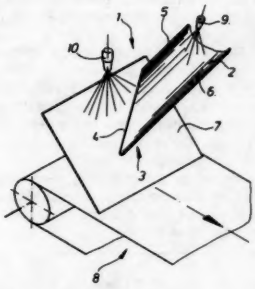
h) sharpening said emission tips.

5,151,062

APPARATUS FOR TURNING OVER FISH FILLETS

Hugo Pontow, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG, Lubeck, Fed. Rep. of Germany

Filed Jul. 3, 1991, Ser. No. 725,687
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1990, 4022451
Int. Cl.[5] A22B *3/08*
U.S. Cl. 452—179 **9 Claims**



1. An apparatus for the automatic turning over of fish fillets having two main surfaces from one of said surfaces onto the other one in order to bring said fillets into a desired position for further processing, the apparatus comprising fillet supplying means for feeding said fillets to be turned over and fillet discharging means for discharging the turned-over fillets toward further processing, wherein:

a) said fillet supplying means includes guiding channel means having a longitudinal axis, arranged in an inclined manner for supporting the forward movement of the fillets by gravity from a starting end to a run-off end, and having two longitudinal edges opposing each other with a run-off edge along said run-off end terminating said longitudinal edges;

b) said run-off edge starts from one of said longitudinal edges and extends forward and across to at least a proximity of the second one of said longitudinal edges thereby deviating from the shortest distance between two opposing points on said opposing longitudinal edges; and

c) guiding face means are arranged adjacent said run-off edge at a predetermined distance thereto and extending essentially in the direction of said longitudinal axis of said guiding channel means, said guiding face means being arranged to extend underneath said guiding channel means when seen in the vertical dimension, and in an inclined manner.

5,151,063

AIR CONDITIONING DISTRIBUTION SYSTEM

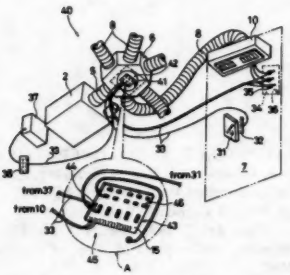
Ichiro Tanaka; Seiji Sasaki; Zen-ichi Kakubari, and Osamu Kojima, all of Kohnan, Japan, assignors to Zexel Corporation, Japan

Filed Oct. 3, 1990, Ser. No. 592,131

Claims priority, application Japan, Oct. 3, 1989, 1-257154; Oct. 3, 1989, 1-257155; Oct. 3, 1989, 1-257156

Int. Cl.[5] F24F *7/08*

U.S. Cl. 454—258 15 Claims



1. An air conditioning system comprising:

an air conditioning unit,

a blower for blowing conditioned air,

a polygonal branch chamber of prescribed volume having an inspection hole in its bottom surface covered by a removable cover,

a main duct for delivering conditioned air from the blower to the polygonal branch chamber,

a plurality of branch ducts provided with respective dampers and connected between the polygonal branch chamber and a plurality of discrete spaces for delivering the conditioned air from the polygonal branch chamber to the plurality of discrete spaces, and

an electrical circuit board providing means for controlling said respective dampers of the branch ducts,

said electrical circuit board being mounted on the outer bottom surface of said cover.

5,151,064

GRAIN TANK FOR A HARVESTER THRESHER

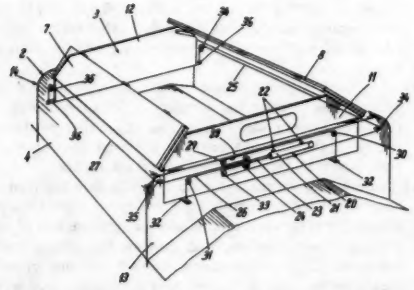
Martin Damman, and Gerhard Theissing, both of Harsewinkel, Fed. Rep. of Germany, assignors to Class OHG, Harsewinkel, Fed. Rep. of Germany

Filed May 9, 1991, Ser. No. 697,890

Claims priority, application Fed. Rep. of Germany, May 21, 1990, 4016319

Int. Cl.[5] A01F *12/60*

U.S. Cl. 460—23 12 Claims



1. A grain tank for a harvester thresher, comprising a plurality of walls including side walls and end walls which together form an upper filling opening; a cover articulately connected with each of said side walls and adapted to close said filling opening; vertically displaceable plates connected with said end walls and associated with said covers so that said covers in an upwardly folded condition together with said upwardly placed plates form a box-shaped structure to increase a volume of the grain tank; straight guides mounted on an inner side of said end walls; power means operatively connected with said plates, so that said plates are upwardly and downwardly displaceable in said straight guides by said power means and said covers which are articulately connected with said side walls are turned by said plates.

5,151,065

TORSION DAMPING APPARATUS FOR USE WITH FRICTION CLUTCHES IN THE POWER TRAINS OF MOTOR VEHICLES

Paul Maucher, Sasbach, and Oswald Friedmann, Lichtenau, both of Fed. Rep. of Germany, assignors to LUK Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

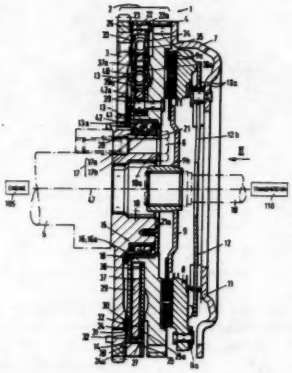
Continuation of Ser. No. 416,954, Oct. 4, 1989, abandoned, which is a division of Ser. No. 256,236, Oct. 11, 1988, which is a continuation of Ser. No. 717,327, Mar. 29, 1985, abandoned.

This application Jan. 18, 1991, Ser. No. 643,150

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421698; Jul. 7, 1984, 3425159

Int. Cl.[5] F16D *3/14, 3/66;* F16F *15/12*

U.S. Cl. 464—68 13 Claims



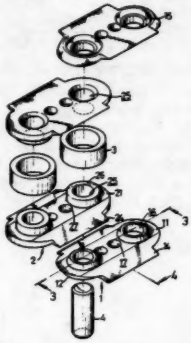
1. Apparatus for compensating for angular shocks, including fluctuations of torque, which are transmitted between an engine and an input element of a variable-speed transmission, comprising at least two coaxial flywheels including a first flywheel connectable with the engine and a second flywheel connectable with the input element by way of an engageable clutch; and damper means for opposign rotation of said first and second flywheels relative to each other, said damper means comprising an intermediate member rotatable with reference tos aid first and second flywheels, and first and second ampers provided between said intermediate member and said first and second flywheels, respectively, said intermediate member having a radially outermost portion and one of said first and second flywheels having means for centering said radially outermost portion, said intermediate member being centered only by said one flywheel and only at said radially outermost portion thereof and each of said first and second dampers having means for limiting the angular movability of said first and second flywheels relative to each other.

5,151,066

STREAMLINE CHAIN

Chia L. Wu, No. 734, Chung Shan Rd.,, Kuei Jen Hsiang, Tainan Hsien, Taiwan

Filed Feb. 1, 1991, Ser. No. 649,039
Int. Cl.[5] F16G *13/02*
U.S. Cl. 474—206 3 Claims



1. A chain comprising a plurality of pairs of outer and inner chain plates linked by rollers and pins, wherein the improvement comprises:

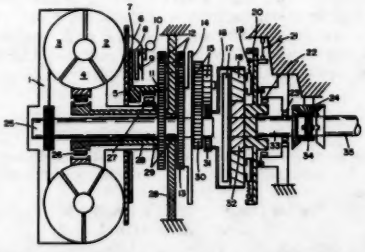
each said outer and inner chain plates being formed as a rectangle having a protuberant lateral arched portion on each transverse end thereof and having first and second countersunk through holes, respectively, on each lateral arched portion thereof to receive a chain pin; each said inner chain plate having inward cylindrical flanges on an inner face thereof around a periphery of said first and second through holes for supporting said roller; each said outer chain plate having frustum-like projections on a inner face thereof around a periphery of said first and second through holes being fittable to said first and second through holes on said inner chain plates; each said lateral arched portion of said outer chain plate having a blade portion along an edge on an inner face thereof, thereby allowing said outer chain plate to reduce a twisting angle formed between and adjacent sprocket and said chain.

5,151,067

VEHICLE AUTOMATIC TRANSMISSION SYSTEM

Chin-Fu Huong, No. 14-4, Lane 263, Sec. 2, Wen Hwa Rd., Panchiao, Taipei, Taiwan

Continuation-in-part of Ser. No. 426,885, Oct. 25, 1989, abandoned. This application May 13, 1991, Ser. No. 699,173
Int. Cl.[5] F16H *47/08*
U.S. Cl. 475—43 3 Claims



1. A fully automatic vehicle power transmission system for a vehicle engine, comprising in combination first and second annuli,

a torque output shaft and a front output shaft pivoted to said first and second annuli, respectively,

a centrifugal clutch lining and a drivable drum wheel set in series between said second annulus and said front output shaft a torque converter,

a clutch pressure bearing plate couplable to said torque converter,

a centrifugal weight controlling said clutch pressure plate and being coupled to said torque converter,

a clutch spring, a clutch pressure plate, and a clutch lining connector set in serial order between said clutch pressure bearing plate and said centrifugal weight,

a shifting gear couplable to said front output shaft,

a rear output shaft couplable to said shifting gear,

said centrifugal weight being drivable to urge said clutch pressure bearing plate to said clutch lining connector, thereby permitting power transmission from said vehicle engine through said torque converter and said first annulus for a first speed reduction, and further through said second annulus for a second speed reduction, so as to thereafter operate in a slow shift mode, said power transmission further passing through said front output shaft, and said shifting gear to said rear output shaft,

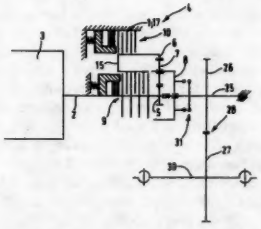
said centrifugal clutch lining driving said second annulus into coupling engagement with said drivable drum wheel upon the revolving speed of said second annulus reaching a predetermined range so as to shift power to a fast shift mode, or alternatively so as to shift power to an intermediate shift mode when the revolving speed of said second annulus is below said predetermined range.

5,151,068

DRIVING MECHANISM WITH TWO SPEED CLUTCH

Egon Mann; Helmut Eymüller, and Siegfried Stützle, all of Friedrichshafen, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Fed. Rep. of Germany

PCT No. PCT/EP89/00240, § 371 Date Aug. 31, 1990, § 102(e) Date Aug. 31, 1990, PCT Pub. No. WO89/08796, PCT Pub. Date Sep. 21, 1989
PCT Filed Mar. 8, 1989, Ser. No. 573,045
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808067
Int. Cl.[5] F16H *3/44*
U.S. Cl. 475—322 3 Claims



1. A drive mechanism for a mobile excavation vehicle having a housing (1) containing a power shiftable two-speed transmission designed as a planetary transmission and driven by an input shaft from a prime mover (3) with continuous speed and torque conversion starting from an initial speed of zero, a sun gear (5) being fixedly connected with the input shaft of said two-speed transmission (4), the two speeds of said transmission being alternately engageable and disengageable via hydraulically shiftable first and second friction clutches (9, 10), at least one fluid pump being provided for supplying pressurized lubricating fluid, and both said friction clutches (9, 10) being spring clutches biased into engagement by a resilient member and disengageable by fluid pressure and both serving to shift gears

of said two-speed transmission and as a parking and auxiliary service brake,

wherein said second friction clutch (10) is situated for optional locking of an annulus gear (6) of said two-speed transmission (4) with respect to said housing (1),

both said first and second friction clutches (9, 10) are radially telescoped and are actuatable independently of each other, and

said first friction clutch (9) is a radially internal friction clutch situated for optional locking of said two-speed transmission and providing direct drive therethrough.

5,151,069

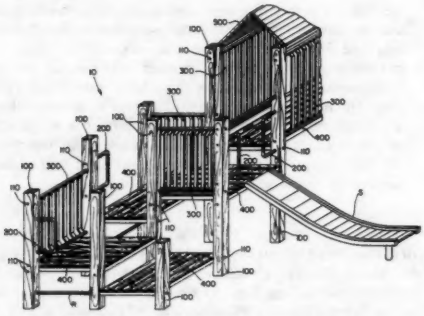
PLAYGROUND EQUIPMENT

Gerald P. Skalka, Washington, D.C., assignor to Recreation Technology, Inc., Dunkirk, Md.

Filed Nov. 5, 1990, Ser. No. 610,075

Int. Cl.[5] A63B *9/00*

U.S. Cl. 482—35 **7 Claims**



1. A vertically extending structure comprising:

a roof member, said roof member comprising first and second parallel, spaced-apart bars and a plurality of rafter members, said rafter members being parallel to each other, each said rafter member comprising first and second rafters extending upwardly at an angle from said first and second bars, respectively, and meeting to form a peak above said first and second bars, and each said rafter member extending upwardly from and being attached to both of said bars to form a unitary structure, each of said bars having first and second free ends, said rafter members being positioned between and offset from said first and second free ends, said free ends being coplanar and each of said free ends being provided with internal threads and including means for penetrating wood,

first, second, third, and fourth spaced wooden support members for supporting said roof member, said support member defining the vertices of a rectangle and each having therein a transverse opening extending therethrough, said transverse openings of said first and second support members being axially aligned with and receiving said first and second free ends, respectively, of said first bar, said transverse openings of said third and fourth support members being axially aligned with and receiving said first and second free ends, respectively, of said second bar, said transverse openings each including an inwardly-facing portion of a size and shape to matingly receive and to envelop in a supporting fashion one of said free ends, a central bolt-body-receiving portion having a transverse dimension less than that of said inwardly-facing portion, and an outer bolt-head-receiving portion having a greater transverse dimension than said central bolt-body-receiving portion, and

first, second, third, and fourth bolts extending through said transverse openings of said first, second, third, and fourth support members, respectively, each of said bolts having a head and a threaded end threadably engaged with said internal threads of one of said free ends of first and second bars, whereby tightening of said bolts pulls said first and second bars of said roof member into said support members at the innermost extent of said inwardly facing portion of said transverse openings to tend to prevent the removal of said roof member from said inwardly facing portions if any of said bolts is removed, and whereby said roof member rigidly connects said first, second, third, and fourth support members.

5,151,070

RESISTANCE TRAINING DEVICE

Peter G. Norman, 35 Cambridge Park Court, Twickenham, Middlesex TW1 2JN, England

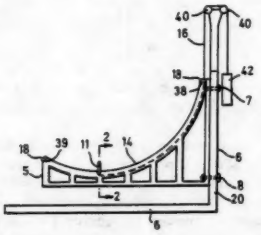
Continuation of Ser. No. 399,465, filed as PCT/GB88/00104, Feb. 18, 1988, abandoned.

This application Aug. 5, 1991, Ser. No. 742,203

Claims priority, application United Kingdom, Feb. 19, 1987, 8703833; Mar. 17, 1987, 8706302

Int. Cl.[5] A63B *21/00*

U.S. Cl. 482—99 **15 Claims**



1. A resistance training device comprising a track defining a predetermined at least partially non-linear path and which path defines a plane, operating means coupled to the track, and resistance means for providing a resistance force coupled to the operating means, wherein the operating means is movable by action of a user along the path defined by the track against the resistance force provided by the resistance means, said operating means comprising a first bearing member and a handle, said handle connected to said first bearing member, said track comprising a second bearing member, said second bearing member comprising an elongate channel, the first bearing member comprising a runner coupled for movement relative to said second bearing member and coupling means comprising a flexible elongate member having a body part having a longitudinal axis and first and second ends, said body part comprising a first portion including said first end and a second portion including said second end, said first end connected to said runner and said second end connected to said resistance means, said first portion defined as that portion of the body part that is within said channel, said first portion being of variable length depending upon what length of said body part is within said channel at any given time, and said second portion being the remainder of said body part, said first portion of said body part being enclosed at all times within said channel and axially following the same path as said track, said first portion being disposed within said plane.

5,151,071

ISOINERTIAL LIFTING DEVICE

Sanjeev Jain, Columbia, and John E. Vermette, Baltimore, both of Md., assignors to Baltimore Therapeutic Equipment Co., Hanover, Md.

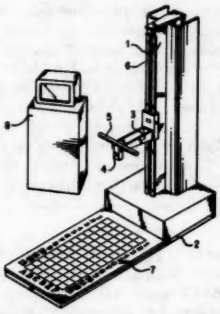
Filed Oct. 5, 1990, Ser. No. 593,886

Int. Cl.[5] A63B *21/062*

U.S. Cl. 482—101 **5 Claims**

1. A device for exercise and evaluating of both applied dynamic and static force which comprises an upright standard

having a horizontal arm mounted thereon for vertical movement on said standard in a dynamic mode, said arm having a force sensor means for registering applied force attached on the distal end thereof and handle means attached to said force sensor means for applying force to said arm in either the horizontal or vertical direction; said arm being connected to first elongated, flexible connector means which is attached to a rotatable drive pulley mounted on a shaft such that said vertical movement of said arm causes rotation of said shaft; second flexible elongated connector means connecting a weight means



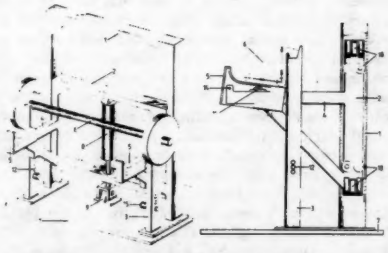
to a rotatable weight pulley also mounted on said shaft such that rotation of said weight pulley causes vertical displacement of said weight means; clutch means mounted on said shaft for causing engagement/disengagement of said drive pulley and weight pulley to cause the respective pulleys to turn together or independently of one another; said horizontal arm being provided with means for locking it in position on said standard in the static mode to prevent said vertical movement in response to force applied thereto; and said force sensor means being connected to means for evaluating and recording applied force in both the static and dynamic modes.

5,151,072

FREE WEIGHT BARBELL SPOTTING AND RACKING MACHINE

Dennis E. Cone, 1726 5th Ave., Oakland, Calif. 94606, and James H. Gibson, 1511 150 Ave. #14, San Leandro, Calif. 94578

Filed May 14, 1991, Ser. No. 699,916
Int. Cl.[5] A63B *21/078*
U.S. Cl. 482—104 **3 Claims**



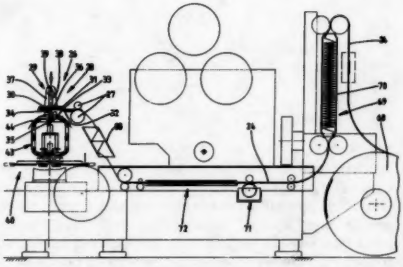
1. A barbell exercise apparatus comprising:
a stationary frame;
a stationary rack for retaining a barbell thereon associated with said stationary frame;
a reciprocating frame having a pair of parallel horizontally extending arms, the arms having a distal end remote from the stationary frame, the reciprocating frame mounted within or about the stationary frame for vertical reciprocal movement thereon;
a pair of switches, one switch mounted on each arm between the ends thereof;
a pair of sleeves, one sleeve pivotally mounted to the distal end of each of the pair of arms, each sleeve overlaying the respective distal portion of the arm and switch such that downward pivotal movement of the sleeve activates its respective switch;
biasing means for normally biasing the sleeves upwardly away from the arms; and,
an electrically powered hydraulic cylinder mounted on the stationary frame, the reciprocating frame mounted to the electrically powered hydraulic cylinder such that actuation of the electrically powered hydraulic cylinder causes upward vertical movement of the reciprocating frame, the switches operatively connected to the electrically powered hydraulic cylinder such that activation of the switch causes actuation of the electrically powered hydraulic cylinder and concurrent upward vertical movement of the reciprocating frame;
whereby engagement of the barbell on the sleeves and horizontally extending arms causes downward pivoting of the sleeve thus activating the switch, which in turn actuates the electrically powered hydraulic cylinder, which in turn causes upward vertical movement of the reciprocating frame having horizontally extending arms, thus removing the barbell from the weight lifter.

5,151,073

APPARATUS FOR THE PRODUCTION OF CIGARETTE PACKS

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Continuation of Ser. No. 501,205, Mar. 29, 1990, Pat. No. 5,052,993. This application Jun. 20, 1991, Ser. No. 718,133
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1989, 3910986
The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.
Int. Cl.[5] B31B *3/14*; B65B *19/02*
U.S. Cl. 493—79 **16 Claims**



1. An apparatus for the production of hinge lid packs from thin cardboard blanks (20) which are folded and filled in a rotatable folding turret (40), wherein:
each of the blanks (20) is of a generally rectangular configuration and has two long edges, and the blanks are interconnected with one another at their long edges to form a web (24);
the blanks (20) are interconnected solely by a line of residual connections (25);
said apparatus comprises, in a blank station (26), severing means for severing the blanks (20) from the web (24) an transferring them to said folding turret (40);
said apparatus further comprises feeding means for continu-

ously feeding the web (24) to said blank station (26) while the blanks (20) are being severed from a stationary portion of the web in said blank station (26); and

said apparatus further comprises, upstream of said blank station (26), a compensation store means (88) for temporarily storing the fed web (24) in a zig-zag configuration formed by the pivoting of adjacent pairs of blanks about the line of residual connections (25) to form included angles which vary during feeding of the web.

4. An apparatus for the production of hinge lid packs from thin cardboard blanks (20) which are folded and filled in a rotatable folding turret (40), wherein:

each of the blanks (20) is of a generally rectangular configuration and has two long edges, and the blanks are interconnected with one another at their long edges to form a web (24);

a collar (21) is connected to each blank (20) by webs (22) so that collars (21) of the interconnected blanks (20) are arranged at a border of the web (24); and

said apparatus comprises: severing means (26), in a blank station (26), for severing the blanks from the web; upstream of said blank station (26), a folding track (72) and rollers (81, 82; 86, 87) for transporting the web (24) through said folding track (72); and folding means for folding the web in said folding track (72) and having a folding edge (75) for z-folding of said webs (22) of the collar (21).

5,151,074

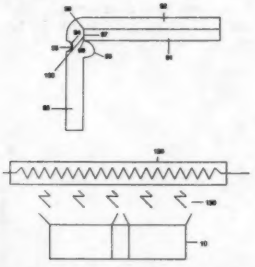
METHOD OF MANUFACTURING MEDICAL APPLIANCE DISPOSAL CONTAINER

James L. Simpson, Indialantic, Fla., assignor to Hemox, Inc., Melbourne, Fla.

Continuation of Ser. No. 449,675, Dec. 12, 1989, abandoned, which is a division of Ser. No. 300,946, Jan. 24, 1989, Pat. No. 4,927,076. This application Dec. 5, 1991, Ser. No. 803,105

Int. Cl.[5] B31B *3/64, 3/66*

U.S. Cl. 493—133 **3 Claims**



1. A method of making a container comprising the steps of:

(a) providing a substantially flat sheet material having a laminated structure containing compact fibrous material and an outer layer of material that is effectively impervious to the passage of fluid therethrough and which, when irradiated by infrared rays for a prescribed period of time, becomes tacky;

(b) forming, in the sheet material provided in step (a), a plurality of foldable panels that are to be folded and joined together to define bottom, sidewall and top portions of a body;

(c) irradiating said sheet material with infrared electromagnetic energy so as to heat said outer layer to its tacky condition; and

(d) folding and joining together sheet panels that have been irradiated in step (c), whereby folded and joined together sheet panels are bonded to one another by means of the outer layer of said sheet material, so as to form said container;

(e) coating interior intersections of bottom and sidewall portions of said body with fluid absorption resistant material; and

(f) prior to step (d), scoring said foldable panels of sheet material along lines spaced apart from folded corners thereof, so as to cause, during the folding of sheet panels in step (d), the formation of beads in said sheet material that are separated from the corners of fold in said sheet material, wherein the scoring of a respective one of said foldable panels of sheet material comprises scoring said respective one of said foldable panels of sheet material on one side thereof at a region adjacent to a fold location so as to cause the protrusion of a bead on an opposite, interior side of said respective one of said foldable panels of sheet material, such that a side edge of a respective one of said foldable panels of sheet material abuts against an interior fold corner of another of said foldable panels of sheet material that is folded to be contiguous therewith and is captured between said bead and interior folded corner of said another of said foldable panels of sheet material, thereby effectively providing a sealed joint thereat and preventing the formation of a leakage space between the interior of said container and the exterior thereof.

5,151,075

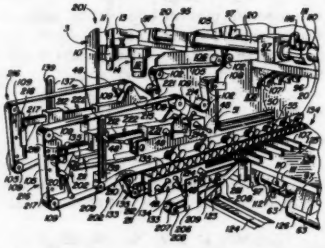
CARTON FOLDING APPARATUS

Norman R. Beaulieu, Nashua, N.H.; David E. Clark, Shreveport, La.; Arthur B. Clingman, III, Shreveport, La.; Richard F. Jeffrey, Shreveport, La.; James A. Mahlum, Stonewall, La., and Larry E. Reeves, West Monroe, La., assignors to J & L Industries, Inc., Keithville, La.

Filed Nov. 5, 1990, Ser. No. 608,910

Int. Cl.[5] B31B *1/06*

U.S. Cl. 493—179 **32 Claims**



1. A carton folding apparatus comprising a feed module for receiving and delivering unfolded cartons, said feed module comprising spaced first support means; a pair of first vertical guide means slidably carried by said first support means in substantially vertical relationship, respectively; first upper horizontal guide means connecting said first vertical guide means in substantially horizontal relationship; upper feed assembly means mounted on said first upper horizontal guide means in slidably adjustable relationship for aligning the leading edges of the cartons in feeding relationship and guiding the cartons through said feed module; a pair of first vertical adjusting means engaging said first vertical guide means for selectively raising and lowering said first vertical guide means, respectively, said first upper horizontal guide means and said upper feed assembly means in concert; first lower horizontal guide means connecting said first support means in substantially horizontal relationship, a plurality of feed belt roller frame means disposed on said first lower horizontal guide means in spaced, parallel, slidably adjustable relationship and a plurality of endless feed belts carried by said feed belt roller frame means, respectively, for supporting the unfolded cartons;

a feed belt drive motor carried by one of said first support means, a feed belt drum rotatably carried by said first

support means in spaced, parallel relationship with respect to said lower horizontal guide means, said feed belt drum receiving said feed belts in non-encircling, driving relationship, and connecting means connecting said feed belt drive motor to said feed belt drum for rotating said feed belt drum and driving said feed belts on said feed belt roller frame means in concert at said selected speed and to feed said cartons through said feed module in linear, spaced relationship; and at least one carton folding module positioned in unconnected alignment with said feed module, said carton folding module having independently driven, synchronized upper belt means and lower belt means for receiving the unfolded cartons from said feed module and folding the cartons in a selected configuration.

5,151,076

MANUFACTURING METHOD FOR A FLEXIBLE CONTAINER

Olaf Strand, Porsgrunn, Norway, assignor to Norsk Hydro A.S., Oslo, Norway

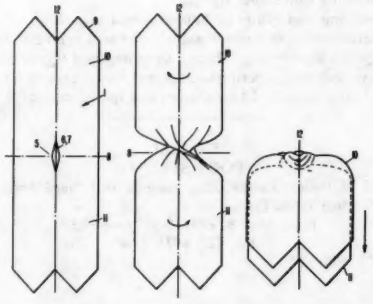
PCT No. PCT/NO89/00134, § 371 Date Jul. 11, 1991, § 102(e) Date Jul. 11, 1991, PCT Pub. No. WO90/06844, PCT Pub. Date Jun. 28, 1990

PCT Filed Dec. 21, 1989, Ser. No. 720,846

Claims priority, application Norway, Dec. 21, 1988, 885700

Int. Cl.[5] B31B *1/74*

U.S. Cl. 493—186 **7 Claims**



1. In a method of manufacturing a flexible container for use in lifting, transportation and storage of bulk material, wherein said container is formed form an elongated hose-like blank of material having a longitudinal axis and a circumference by turning a first half-length portion of said blank inside out and fitting said first half-length portion over a second half-length portion of said blank thereby forming inner and outer sacks to be fitted with a base construction, the improvement comprising:

forming in a middle length portion of said elongated blank at least two axially extending openings spaced equally around said circumference; and

rotating, in the area of said openings, said first half-length portion of said blank relative to said second half-length portion of said blank about said longitudinal axis, and thereby, after said turning said first half-length portion inside out and fitting said first half-length portion over said second half-length portion, forming areas of said material between said openings into at least two integrated lifting loops of rotated material.

5,151,077

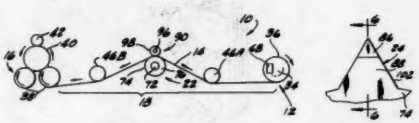
METHOD AND APPARATUS FOR PERFORATING MATERIAL

William R. Cole, Jr.; Charles H. Sanborn, III, and J. Dwight Clanton, all of Shelbyville, Tenn., assignors to ARK, Inc., Shelbyville, Tenn.

Filed Jul. 31, 1991, Ser. No. 738,343

Int. Cl.[5] B26F *1/22, 1/24, 1/20*

U.S. Cl. 493—353 **14 Claims**



1. Apparatus for perforating paper, the apparatus comprising,

means for holding a supply of paper to be perforated,

means for taking up paper from said holding means, a reach of paper extending between said holding means and said take-up means having transversely opposite longitudinal edges,

means for driving the paper in a forward direction along the reach from said holding means to said take-up means at a selected speed,

means generally between said holding means and said take-up means for perforating the paper in the reach generally from edge to edge thereof, said perforating means comprising a perforating roller mounted for rotation about an axis generally parallel to the reach and perpendicular to the direction of travel of the paper in the reach, the perforating roller being disposed for engaging the paper in the reach and including teeth adapted to pierce the paper upon engagement therewith, the direction of travel of the teeth at the location of engagement with the paper being the same as the direction of travel of the paper along the reach,

each tooth having an upper portion and a lower portion, the upper portion being sharpened to facilitate penetration of the paper and including a generally triangular shaped planar surface facing rearwardly relative the direction of rotation of the perforating roller, the lower portion being unsharpened and including a generally rectangular shaped planar surface facing generally rearwardly relative to the direction of rotation of the perforating roller,

said driving means rotating the perforating roller at a rate such that the speed of the teeth is less than the speed of the paper in the forward direction along the reach whereby the paper moves forward relative the teeth and against the rectangular shaped planar surfaces thereof after penetration of the paper so that the teeth form elongate openings extending generally rearwardly of the points of penetration of the teeth, the teeth tearing away flaps of the paper to form the openings, the flaps remaining connected to the paper at the rearward edge of the openings.

5,151,078

METHOD FOR FOLDING PIECES OF PAPER INTO LETTERS OF THE ALPHABET

Yi-Teh Lin, Shihtsuo 76, 4th Lin, Shihtsuo Village, Mailiao Hsiang, Yunlin County, Taiwan

Filed Jan. 2, 1992, Ser. No. 816,875

Int. Cl.[5] B65H *45/12*

U.S. Cl. 493—405 **4 Claims**

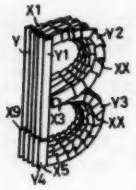
1. A method for folding paper into alphabet letter shapes, comprising:

defining a rectangular piece of paper with an X-axis parallel to a width thereof and a Y-axis parallel to a length thereof;

folding the piece of paper into an alphabetic letter at lines

parallel to X-axis, thereby dividing said piece of paper into a plurality of segments;

in segments to be formed into curves, defining a plurality of alternative lines X' and X" parallel to said X-axis so that a sub-segment of paper between every two sequential lines X' and X" is longer than a sub-segment of paper between every two sequential lines X" and X';



corrugating the piece of paper at said alternative lines X' and X";

corrugating the piece of paper at lines parallel to said Y-axis; and

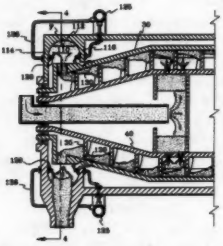
bending said folded and corrugated piece of paper into an alphabetic letter shape.

5,151,079

METHOD AND APPARATUS FOR REDUCTION OF PARTICLE DISINTEGRATION

David A. Flanigan, Cleveland, Okla., and John D. Boadway, Kingston, Canada, assignors to Conoco Specialty Products Inc., Houston, Tex.

Filed Sep. 27, 1990, Ser. No. 589,720
Int. Cl.[5] B04B *11/00, 1/20*
U.S. Cl. 494—27 **31 Claims**



1. A centrifugal separation device for separating the components of a fluid and particulate mixture, said device comprising:

a particulate receiving surface;

means for at least partially centrifugally separating the components of the mixture and propelling the particulates against said surface; and

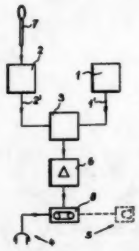
means for absorbing impact forces as the particulates impact against said surface comprising an impact absorbing fluid interposed between said means for centrifugally separating the components and said surface.

5,151,080

METHOD AND APPARATUS FOR INDUCING AND ESTABLISHING A CHANGED STATE OF CONSCIOUSNESS

Claus Bick, Felsenland-Bick-Klinik, D-6783 Dahn, Fed. Rep. of Germany

PCT No. PCT/CH89/00153, § 371 Date Apr. 27, 1990, § 102(e) Date Apr. 24, 1990, PCT Pub. No. WO90/01967, PCT Pub. Date Mar. 8, 1990
PCT Filed Aug. 28, 1990, Ser. No. 490,552
Claims priority, application Switzerland, Aug. 30, 1988, 3219/88
Int. Cl.[5] A61M *21/00*
U.S. Cl. 600—28 **2 Claims**



1. A method for inducing and establishing a deepened state of consciousness in a human that is physically and psychically relaxed or changed by employing electroacoustic means for creating and generating electromagnetic sound signals and for producing electronically altered and synthetic human speech signals, the method comprising:

generating said sound signals;

producing said synthetic human speech signals;

superimposing said sound signals and said synthetic human speech signals to produce a superimposed signal; and

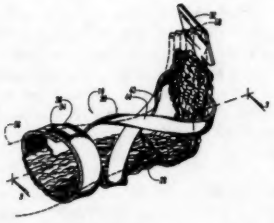
conveying said superimposed signal to the ears of a human by way of one of headphones and loudspeakers.

5,151,081

FOOT SPLINT

Paul J. Williams, Tampa, Fla., assignor to L'Nard Associates, Inc., Clearwater, Fla.

Filed Mar. 8, 1991, Ser. No. 666,370
Int. Cl.[5] A61F *5/00*
U.S. Cl. 602—27 **3 Claims**



1. A foot splint, comprising:

an L-shaped plastic splint means comprising an upstanding leg portion having inner and outer surfaces, opposite sides and upper and lower ends, a heel portion contiguous with the lower end of said leg portion, and a generally horizontal foot portion having opposite sides and extending forwardly from said heel portion, and

a stabilizer bar pivotally secured to the upper end of said leg portion on the outside surface thereof, and being pivotally

movable between an inoperative position extending downwardly along the outside surface of said leg portion and an operative position extending transversely to the leg portion.

5,151,082

APPARATUS AND METHOD FOR KIDNEY DIALYSIS USING PLASMA IN LIEU OF BLOOD

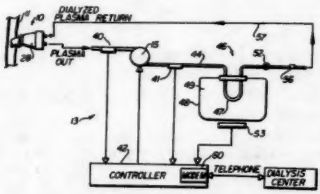
Reynolds G. F. Gorsuch, Yountville, and John Atkin, Corona Del Mar, both of Calif., assignors to Heathdyne, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 229,007, Aug. 5, 1988, Pat. No. 4,950,224. This application Aug. 20, 1990, Ser. No. 570,009

The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.

Int. Cl.[5] H61M *37/00*

U.S. Cl. 604—4 **11 Claims**



1. An apparatus for kidney dialysis using in vivo separation of plasma from blood and extracorporeal separation of toxic metabolic waste from the separated plasma, comprising:

at least one elongated micorporous fiber having a hollow interior, said fiber being dimensioned to be received within a blood vessel without significantly obstructing fluid flow through said blood vessel, the pore size of the fiber being sufficient to allow plasma to diffuse through the pores into the hollow interior of the fiber but not sufficient to allow cellular components larger than plasma to diffuse therethrough;

the hollow interior of said elongated fiber being in fluid communication with a means for conducting plasma comprising a first hollow tube which connects to the hollow interior of the fiber and permits passage of plasma to said blood vessel;

extracorporeal dialysis means receiving the plasma passing through the first tube and removing toxic metabolic waste from the plasma; and

means conducting the plasma from the extracorporeal dialysis means to the second hollow tube for return to the blood vessel.

5,151,083

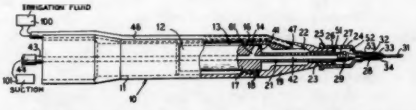
APPARATUS FOR ELIMINATING AIR BUBBLES IN AN ULTRASONIC SURGICAL DEVICE

Robert H. Pichler, Skokie, Ill., assignor to Fibra-Sonics, Inc., Chicago, Ill.

Filed Jul. 29, 1991, Ser. No. 737,425

Int. Cl.[5] A61B *17/00*; A61M *1/00*

U.S. Cl. 604—22 **2 Claims**



1. An ultrasonic handpiece comprising, an ultrasonic motor with an aspirating passage therethrough mounted in said handpiece and formed with a tubular shaped extending portion, suction means connected to said aspirating passage, said passage extending through said tubular-shaped extending portion, a hollow needle attached to said tubular-shaped extending portion, a generally cylindrical-shaped member of said handpiece extending and enclosing said tubular-shaped extending portion to form a cavity and irrigation means adapted to supply irrigation fluid to said cavity and to an operating site at an end of said needle a and an opening formed in said ultrasonic motor between said aspirating passage and said cavity so as to remove bubbles from the irrigation fluid.

5,151,084

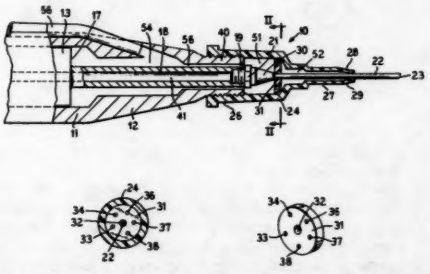
ULTRASONIC NEEDLE WITH SLEEVE THAT INCLUDES A BAFFLE

Sokhuom Khek, Chicago, Ill., assignor to Fibra-Sonics, Inc., Chicago, Ill.

Filed Jul. 29, 1991, Ser. No. 737,424

Int. Cl.[5] A61B *17/00*; A61M *1/00*

U.S. Cl. 604—22 **1 Claim**



1. An ultrasonic handpiece for performing operations comprising, an ultrasonic motor mounted in said handpiece, a tubular portion extending from said ultrasonic motor, a hollow needle attached to an end of said tubular portion, a conical portion of said ultrasonic handpiece extending around said tubular portion and a first cavity formed therebetween, an irrigating tube connected to said conical portion and supplying irrigating fluid to said first cavity, a flexible sleeve connected to an end of said conical portion and extending around said needle, a second cavity formed between said sleeve and said needle and fluidly connected to said first cavity, a planar baffle mounted in and across said sleeve and formed with a plurality of equally spaced openings which extend in a direction parallel to said needle, a third cavity formed between said sleeve and said needle and said second and third cavities in fluid communication through said plurality of said openings in said planar baffle, and an outlet opening formed in said sleeve and in fluid communication with said third cavity, said planar baffle mounted so that its plane extends in a direction which is 90 degrees to said needle, wherein suction is applied to said tubular portion for aspiration, and wherein a shoulder is formed at the junction of said tubular portion and said ultrasonic motor.

5,151,085

APPARATUS FOR GENERATING ULTRASONIC OSCILLATION

Tomohisa Sakurai, Tokyo, and Masakazu Gotanda, Tsukui, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1990, Ser. No. 513,230

Claims priority, application Japan, Apr. 28, 1989, 1-107788; May 15, 1989, 1-120958

Int. Cl.[5] A61B *17/32*

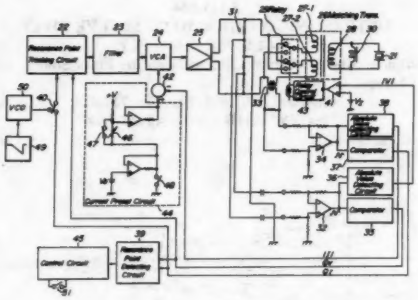
U.S. Cl. 604—22 **11 Claims**

1. An apparatus for generating an ultrasonic oscillation comprising:

an ultrasonic transducer having an ultrasonic vibrating element for producing an ultrasonic oscillation and a probe for transmitting the oscillation produced by the ultrasonic vibrating element;

a driving circuit for supplying a driving power to said ultrasonic vibrating element;

an impedance matching means connected between said ultrasonic transducer and said driving circuit for matching the output impedance of the driving circuit to the impedance of said ultrasonic transducer;



an impedance detecting means for detecting the impedance of said ultrasonic transducer to generate an impedance detection signal; and

controlling means for automatically controlling said impedance matching means in accordance with said impedance detection signal supplied from said impedance detecting means such that the output impedance of said driving circuit is matched to the impedance of said ultrasonic transducer.

5,151,086

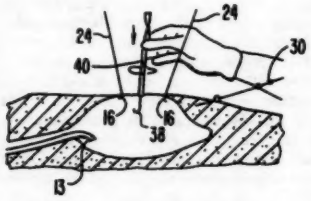
LAPAROSCOPIC TUBE PLACEMENT METHOD

Quan-Yang Duh, and Lawrence W. Way, both of San Francisco, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Oct. 22, 1991, Ser. No. 780,773

Int. Cl.[5] A61M *31/00*

U.S. Cl. 604—51 **15 Claims**



1. A method of placing a tube in a hollow body organ through a body wall having an interior surface juxtaposed with the body organ and separated therefrom by a space and an exterior surface outside the body comprising the steps of:

(a) performing a laparoscopy through the body wall in a location so as to bring the organ under direct vision;

(b) inserting a plurality of retraction device introducers through said body wall and into said space and into said organ under direct vision;

(c) fixing a like plurality of retraction devices to said organ by means of said introducers;

(d) fixing said body organ in contacting relation with said interior surface by means of said retraction devices;

(e) inserting a hollow tube through said body wall into said body organ; and

(f) fixing said tube in said body organ.

5,151,087

AORTIC ROOT CANNULA

Kenneth R. Jonkman, Grand Rapids, Mich., assignor to DLP, Inc., Grand Rapids, Mich.

Filed Aug. 30, 1991, Ser. No. 753,038

Int. Cl.[5] A61M *5/178*

U.S. Cl. 604—164 **9 Claims**

3. An introducer cannula for use with the human body which comprises:

(a) a cannula body having an insertable tip at a distal end and a connector end at a proximal end,

(b) a needle slidable in said body having a penetrating point projectable through said tip,

(c) a removable fitting at the proximal end of said cannula,

(d) a gas-pass-water occluding plug at a distal end of said fitting surrounding said needle,

(e) a stop means adjacent the distal end of said needle to contact said plug upon withdrawal of said needle into said fitting, and

(f) said fitting having an axial length long enough to receive the point of said needle when the needle is withdrawn prior to the removal of said needle and said fitting from said cannula.

5,151,088

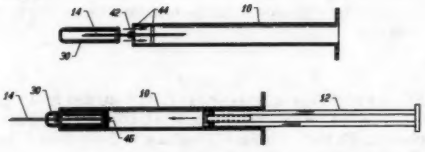
SAFETY NEEDLE AND SYRINGE ASSEMBLY

A. Christopher Allison, Pacifica, and Richard A. Jaffe, Palo Alto, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jul. 31, 1991, Ser. No. 738,419

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—192 **11 Claims**



1. A disposable safety needle and syringe assembly comprising

a syringe including a housing having opposing open ends,

a plunger and plunger piston movably positioned within said housing from one end,

a needle and needle support positioned at the other end of said housing with said needle including an external portion extending from said housing, and

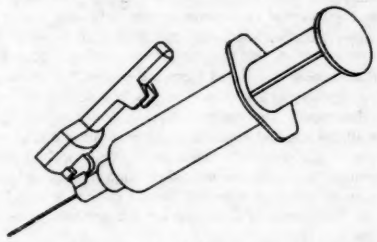
a needle shield movably positioned within said housing from said other end, said needle shield being movable from and extending out of said housing by movement of said plunger and said plunger piston following completion of an injection whereby said needle shield envelopes said needle portion extending from said housing to prevent accidental needle sticks.

5,151,089

RETRACTABLE PROTECTIVE NEEDLE SHEATH

William D. Kirk, III, St. Mary's Road, Lebanon, Ky. 40033; Anthony A. DeCaro, 574 T. P. Cundiff Rd., Columbia, Ky. 42728, and Wayne E. Perry, 233 N. 500 W, Columbus, Ind. 47201

Filed May 16, 1990, Ser. No. 524,009
Int. Cl.[5] A61M 5/32
U.S. Cl. 604—192 7 Claims



1. A protective needle sheath for enclosing a needle including a shaft with a puncturing end comprised of:

(a) A base means;

(b) A retractable arm secured to the base by a pivot means wherein said retractable arm extends beyond the puncturing end of the needle shaft and said retractable arm includes a needle channel for encasing the needle;

(c) An arm actuator secured to the retractable arm to rotate the retractable arm about the pivot means from a closed position wherein the retractable arm encases the needle to an open position wherein the needle is not encased by the retractable arm;

(d) A clasping means attached to the retractable arm for clasping the retractable arm to the needle shaft when the retractable arm is in the closed position, wherein the clasping means includes friction locking tabs located on each side of the needle channel; and

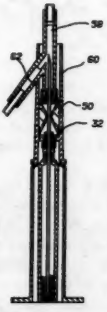
(e) Squeeze tabs secured to the retractable arm which when compressed unclasp the friction locking tabs from the needle shaft when the retractable arm is in a closed position.

5,151,090

SYRINGE AND NEEDLE GUARD ASSEMBLY

Robert J. Best, Winthrop Harbor; Mark E. Larkin, Lindenhurst, and Juergen H. Zaha, Winthrop Harbor, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 19, 1990, Ser. No. 600,556
Int. Cl.[5] A61M 5/32
U.S. Cl. 604—192 12 Claims



1. An additive-type syringe and needle guard assembly including a syringe housing having a front wall substantially closing one end of the housing and a needle hub extending forward from said front wall for securing a needle cannula, said needle cannula extending forward from the hub and terminating with a needle point, and a needle guard fixedly mounted coaxially with the needle hub on said front wall of the syringe housing to protect the needle cannula during use of the assembly in injecting fluids into I.V. administration sets including Y-sites, the syringe and needle guard assembly comprising:

an outwardly flared surface defined by said front wall of said syringe housing;

an elongated member defining said needle guard and having a cylindrical side wall extending forward beyond the needle point of the cannula a fixed distance and having a first open end at the front of the cylindrical side wall and a second outwardly flared open end at the rear of the cylindrical side wall and adjacent said outwardly flared surface defined by said front wall of said syringe housing;

a circumferential flange disposed on and within said elongated member inwardly of the sidewall and intermediate the first open end and the second end of the cylindrical sidewall, said circumferential flange defining an open sized for said needle hub; and

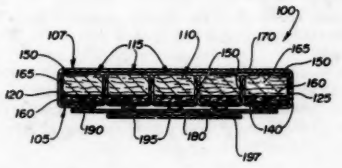
annular means disposed between said adjacent flared surfaces and joining the needle guard to the front wall of the syringe housing.

5,151,091

ABSORBENT STRUCTURE HAVING MULTIPLE CANALS

Frank S. Glaug, Spotswood, and William B. Mattingly, III, East Brunswick, both of N.J., assignors to McNeil-PPC, Inc., Milltown, N.J.

Continuation of Ser. No. 247,820, Oct. 24, 1988, abandoned.
This application Feb. 21, 1991, Ser. No. 659,200
Int. Cl.[5] A61F 13/15, 13/20
U.S. Cl. 604—385.1 1 Claim



1. An absorbent structure having a body-facing side, a garment-facing side, a longitudinal axis and a transverse axis, which comprises:

(a) a fluid permeable cover on said body-facing side;

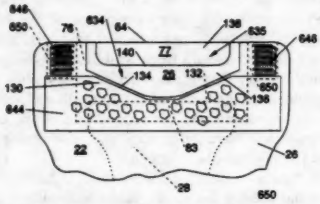
(b) at least two abutted absorbent chambers formed by fluid repellent walls comprising moisture impermeable polymeric film selected from the group consisting of impermeable dense polymeric film, microporous film or apertured polymeric film, wherein said film comprises a layer of ethyl, vinyl acetate film and an adjacent layer of polyethylene film, wherein said ethyl, vinyl acetate film is located on the garment-facing side of the absorbent structure, said chambers extending generally along the longitudinal axis of the absorbent structure, said chambers containing absorbent material such that the absorbent material in each of said chambers is separated from absorbent material in adjacent absorbent chambers by said fluid repellent walls, which are adapted to direct the flow of fluid along the longitudinal axis of the absorbent structure.

5,151,092

ABSORBENT ARTICLE WITH DYNAMIC ELASTIC WAIST FEATURE HAVING A PREDISPOSED RESILIENT FLEXURAL HINGE

Kenneth B. Buell, Cincinnati; Sandra H. Clear, Maineville, and Danielia T. Falcone, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 715,152, Jun. 13, 1991, abandoned. This application Aug. 22, 1991, Ser. No. 750,775
The portion of the term of this patent subsequent to Sep. 29, 2009, has been disclaimed.
Int. Cl.[5] A61F *13/15, 13/20*
U.S. Cl. 604—385.2 53 Claims



1. A disposable absorbent article comprising:

a containment assembly comprising an absorbent core having side edges and waist edges;

an elastic waist feature at least extending longitudinally outwardly from one of said waist edges of said absorbent core, said elastic waist feature comprising

(a) an elasticized waistband comprising

(i) a shaping panel zone being elastically extensible in at least the lateral direction,

(ii) a waistline panel zone resiliently flexurally joined with said shaping panel zone, said waistline panel zone being elastically extensible in at least the lateral direction, and

(iii) a predisposed, resilient, waistband flexural hinge zone joining said shaping panel zone and said waistline panel zone for allowing relative flexural bending between said shaping panel zone and said waistline panel zone when forces are applied and for providing a restoring force/-moment to resiliently return said shaping panel zone and said waistline panel zone to essentially their preceding in-use configuration when the forces are removed, said waistband flexural hinge zone having a bending flexure restoring force greater than about 20 grams/; and

(b) a second flexural hinge zone joining said elasticized waistband to said containment assembly; and

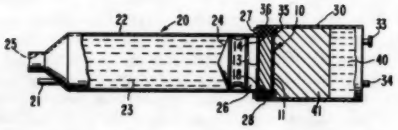
a closure system disposed on the absorbent article for creating-/maintaining lateral tension through at least a portion of said elasticized waistband.

5,151,093

OSMOTICALLY DRIVEN SYRINGE WITH PROGRAMMABLE AGENT DELIVERY

Felix Theeuwes, and Su I. Yum, both of Los Altos, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Oct. 29, 1990, Ser. No. 605,593
Int. Cl.[5] A61K *9/22*
U.S. Cl. 604—892.1 22 Claims



1. An osmotic engine for driving a device adapted to dispense a beneficial agent, the engine comprising a shaped wall surrounding a means for forming a driving fluid and a passageway through the wall for delivering the driving fluid from the engine, at least a portion of the wall being comprised of a material that is permeable to an external liquid, the wall having a sufficient degree of impermeability to an osmotically active material in the engine to generate an osmotic pressure differential across the wall when the wall is exposed to the external liquid;

wherein the means for forming a driving fluid comprises a bilayered tablet having a layer of a gas generating means and a layer of an osmotic solute, whereby the external liquid permeates through the wall portion and forms a solution of the solute, the solution being a first driving fluid which is pumped from the engine and through the passageway at a first rate over a first period of time and subsequently the external liquid permeates through the wall portion and causes the gas generating means to generate a gas, the gas being a second driving fluid which is pumped from the engine and through the passageway at a second rate over a second period of time which follows the first period of time, and second rate being unequal to the first rate.

5,151,094

SUCTION SWAB

Paul H. Hanifl, Barrington, Ill., assignor to Sage Products, Inc., Crystal Lake, Ill.

Filed Mar. 20, 1990, Ser. No. 496,423
Int. Cl.[5] A61C *17/04*
U.S. Cl. 604—902 24 Claims

1. A disposable suction swab, comprising

a. an elongated, hollow stem having opposite ends,

b. means at one end of said stem for connecting said stem to a source of suction,

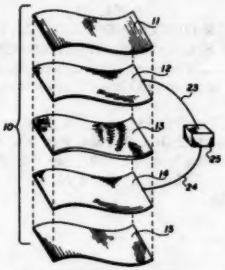
c. means for controlling suction within said stem,

d. an enlarged, solid and resilient tip mounted on the other end of said stem, said tip having a longitudinal central bore accommodating said stem and at least one transverse aperture connected to said central bore,

e. a hole in said stem contiguous to and in axial alignment with said aperture, said aperture being larger in cross-section than said hole, and

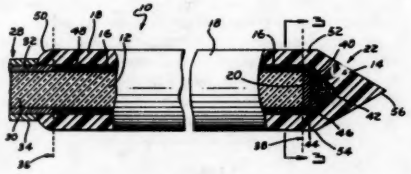
f. means securing said tip to said stem.

5,151,095
LASER SHIELD WITH INDICATOR MEANS
Edward Teeple, Jr., 641 Ridgefield Ave., Pittsburgh, Pa. 15216
Filed Nov. 22, 1989, Ser. No. 440,665
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—2 **15 Claims**



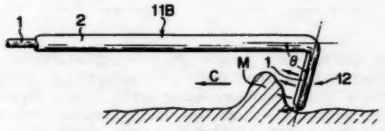
1. A laser shield for use during laser procedures comprising:
a flexible insulating layer;
a first flexible metallic layer positioned adjacent to the insulating layer;
a flexible opaque layer applied to the surface of the metallic layer so as to coextensively interpose the metallic layer between the insulating layer and the opaque layer;
a second flexible metallic layer positioned adjacent to and secured to the insulating layer so as to coextensively interpose the insulating layer between the metallic layers; and
a securing means for attaching the opaque layer, the first and second metallic layer and insulating layer together.

5,151,096
LASER CATHETER DIFFUSER
Adib I. Khoury, Bellows Falls, Vt., assignor to Angiolaz, Incorporated, Rockingham, Vt.
Filed Mar. 28, 1991, Ser. No. 676,307
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—15 **10 Claims**



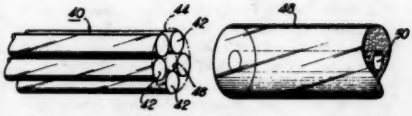
1. An apparatus for transmitting light from a medical laser along an optical fiber to a cancerous tumor, that comprises:
a. an unclad fiber-optic core extending from the optical fiber having any layers surrounding the fiber-optic core removed so that light travelling through the optical fiber and unclad fiber-optic core can pass out of the core;
b. a reflective cap affixed to a terminal end of the unclad fiber-optic core so that light travelling through the optical fiber and unclad fiber-optic core is reflected by the reflective cap back into and around the unclad fiber-optic core away from the terminal end;
c. a diffuser matrix that surrounds the unclad fiber-optic core and reflective cap so that light passing out of the core is diffused by the diffuser matrix; and
d. rigid penetration means for penetrating the cancerous tumor, wherein the penetration means includes a transparent tubular sleeve that encases the diffuser matrix, unclad fiber-optic core and reflective cap so that light diffused by the diffuser matrix moves through the sleeve into the cancerous tumor.

5,151,097
LASER LIGHT EMITTER
Norio Daikuzono, Ichihara, Japan, assignor to S.L.T. Japan Co., Ltd., Tokyo, Japan
Filed Aug. 28, 1990, Ser. No. 573,563
Claims priority, application Japan, Sep. 1, 1989, 1-227092
Int. Cl.[5] A61B *17/35*
U.S. Cl. 606—15 **11 Claims**



1. A laser light emitter for excision of protruding tissue of an animal organism, the emitter comprising:
an optical transmission element having a holding portion through which light is transmitted into a bent portion that has an end surface and a side surface; and
a light impervious material covering a first portion of said side surface of the bent portion of the optical transmission element, such that a second portion of said side surface of the bent portion of the optical transmission element is uncovered, whereby laser light applied to the optical transmission element will be emitted from the uncovered second portion of said side surface of the bent portion to impinge on and excise protruding tissue.

5,151,098
APPARATUS FOR CONTROLLED TISSUE ABLATION
Hanspeter Loertscher, Zedtwitzweg 2, CH-3626, Hunibach, Switzerland
Continuation-in-part of Ser. No. 556,900, Jul. 23, 1990, abandoned. This application Mar. 26, 1991, Ser. No. 675,442
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—16 **20 Claims**



1. A probe for performing endolaser microsurgery and ablating tissues in which said probe is connected to a laser delivery system for delivering pulsed laser power, said system having an optical fiber delivery means with an end surface abutting said probe for conducting said power, said probe comprising a walled tubular member for guiding the laser power through said walls by way of providing multiple reflections at the cylindrical surfaces of said walls and including a central canal through said tubular member for aspiration of liquids and ablated tissue debris and also for use in irrigation and as an instrument channel.

5,151,099

TOOL FOR REMOVAL OF PLASTICS MATERIAL

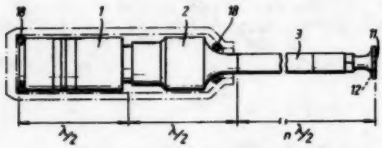
Michael J. R. Young, Bremridge Farm, Ashburton, South Devon, England, and Brian R. D. Bradnock, 39 Blackford Road, Edinburgh, Scotland

Continuation of Ser. No. 499,585, Mar. 27, 1990, abandoned. This application Dec. 3, 1991, Ser. No. 804,617

Claims priority, application United Kingdom, Mar. 28, 1989, 8906898

Int. Cl.[5] A61B *17/38, 17/00, 17/32*; A61F *2/32*

U.S. Cl. 606—27 **9 Claims**



1. A tool for use in removing heat softenable plastics material from a hole in which said plastics material is in a substantially solid state comprising a disc having a work surface on one side adapted to contact said material, piezo electric transducer means operatively connected through a work horn to said disc to cause said work surface to vibrate ultrasonically and thereby to heat locally said plastics material until it is softened, cavity means on a second side of said disc opposite said work surface and adapted to receive said heated and softened plastics material, and passage means connecting said cavity means to a working zone of said plastics material ahead of said disc when engaged by said work surface to enable heated and softened plastics material to flow through said passage means into said cavity means.

5,151,100

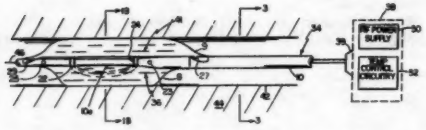
HEATING CATHETERS

John E. Abele, Concord, Mass.; Charles E. Lennox, Hudson, N.H.; Paul C. Nardella, Easton, and Sharad H. Joshi, Norwood, both of Mass., assignors to Boston Scientific Corporation, Watertown, Mass.

Continuation-in-part of Ser. No. 263,815, Oct. 28, 1988, Pat. No. 4,955,377. This application Jul. 3, 1990, Ser. No. 547,931

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—28 **37 Claims**



1. A catheter device for heating tissue, comprising

a longitudinally extending catheter shaft constructed for insertion into a patient's body, said catheter shaft defining at least one lumen for fluid flow through said shaft,

at least a first liquid-expandable chamber mounted on said catheter shaft, said chamber defined at least in part by a flexible wall that engages body tissue, said chamber being associated with said lumen for liquid communication with a liquid source outside the body, said chamber being fillable thereby with said liquid after placement in the body,

a heating device, in contact with said liquid within said chamber when said chamber is expanded, for heating said liquid, so that heat of a controlled temperature can be transmitted from said liquid to surrounding tissue by thermal conduction through said wall of said first chamber, and

means for selectively directing said heat transmission to a selected portion of tissue engaged by said catheter device, said means being interposed between said heated liquid in said chamber and another portion of said tissue to inhibit thermal conduction of heat from said heated liquid to said other portion of said tissue while heat is transmitted from said heated liquid through the wall of said chamber to said selected portion of tissue.

5,151,101

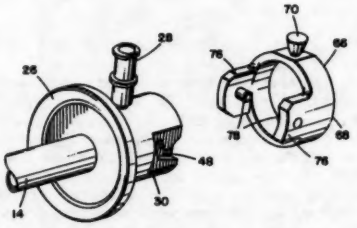
SYSTEM FOR DISCONNECTABLY MOUNTING AN ENDOSCOPE SHEATH WITH AN ENDOSCOPE TOOL

Benedetto Grossi, Stamford, Conn., and Richard P. Muller, Bronx, N.Y., assignors to Circon Corporation, Santa Barbara, Calif.

Division of Ser. No. 513,550, Apr. 24, 1990, which is a division of Ser. No. 203,152, Jun. 2, 1988, Pat. No. 4,920,961. This application Nov. 19, 1990, Ser. No. 615,461

Int. Cl.[5] A61B *17/32*

U.S. Cl. 606—46 **10 Claims**



1. A tool for use in resectoscopy comprising:

frame means defining a working element; and

means operatively connected to the frame means for removably connecting a cooperating sheath having a static latch receptacle means to said working element, said removably connecting means comprising a reciprocally movable latch means having at least one latch member, said reciprocally movable latch means having a biasing means for biasing said at least one latch member in a first position for retaining said at least one latch member within said static latch receptacle means removably connecting said cooperating sheath to said working element, but movable to a second position for disconnecting the at least one latch member from the static receptacle means wherein the static latch receptacle means cooperates with said at least one latch member to urge said working element away from the cooperating sheath whereby the working element is removable from the cooperating sheath without an operator touching the cooperating sheath.

5,151,102

BLOOD VESSEL COAGULATION/STANCHING DEVICE

Hiroyasu Kamiyama, 1-7-3-13 Shinkotoni, Kita-ku, Sapporo-shi, and Hirokazu Amino, Kyoto, both of Japan, assignors to Kyocera Corporation, Kyoto and Hiroyasu Kamiyama, Sapporo, both of, Japan

Filed May 31, 1990, Ser. No. 530,994

Claims priority, application Japan, May 31, 1989, 1-140192; May 30, 1990, 2-140376

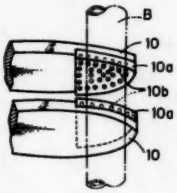
Int. Cl.[5] A61B *17/39*

U.S. Cl. 606—51 **20 Claims**

1. In a bipolar-type blood vessel coagulation/stanching device having a pair of conductive forceps including blood vessel holding sections provided at end portions of said forceps and adapted to cauterize, coagulate and stanch said blood vessel, the improvement comprising:

an electrically and thermally insulative blood vessel contact member of sintered substance provided at each of said end portions, each of said contact members having a blood

vessel contact surface which includes a plurality of exposed electrodes at an areal ratio between 5% and 60% to



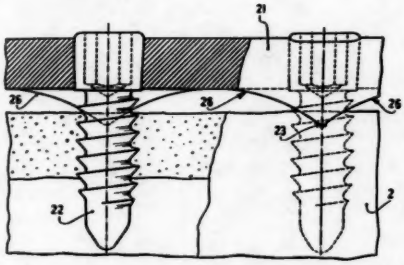
the entire surface area of said blood vessel contact surface of said blood vessel contact member.

5,151,103

POINT CONTACT BONE COMPRESSION PLATE

Slobodan Tepic, Davos; Stephen Perren, Davos Dorf; Fritz Straumann, Waldenburg, and Franz Sutter, Niederdorf, all of Switzerland, assignors to Synthes (U.S.A.), Paoli, Pa.

Division of Ser. No. 492,403, Mar. 8, 1990, Pat. No. 5,053,036, which is a continuation of Ser. No. 247,357, Sep. 21, 1988, abandoned. This application Feb. 28, 1991, Ser. No. 662,634
Claims priority, application European Pat. Off., PCT/EP87/00663
Int. Cl.[5] A61F *5/24*
U.S. Cl. 606—69 **14 Claims**



1. An implant for osteosynthesis comprising a biocompatible device for attachment to a bone, and a plurality of screws for attaching the device to the bone, the heads of said screws and the device having a predetermined friction angle relative to one another, said screws having conical heads and said device having complementary conical holes for receiving said heads in surface contact therewith, the cone angle of the conical holes being less than the friction angle between the holes and the screw head, thereby locking said screws to said device to prevent said device from sliding down the screw heads.

5,151,104

SELF-LOCKING JOINT CONNECTOR

Robert V. Kenna, Hobe Sound, Fla., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Oct. 26, 1989, Ser. No. 427,652
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—73 **8 Claims**

1. A device to be placed into one side of a joint, said device comprising:

(a) a first portion comprising:

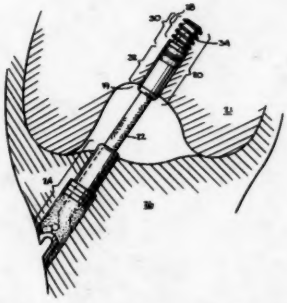
(1) a first screw portion to be screwed into bone in one side of said joint; and

(2) a first means for locking said first portion; and

(b) a second portion which is adapted to be inserted during surgery into proximity with and then remain self-locked with said first portion, said second portion comprising:

(1) a nose portion having a second means for locking said second portion,

wherein said first means for locking and said second means for locking are adapted to lock together,



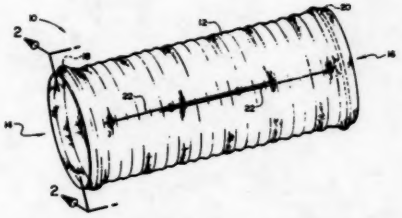
wherein said first means for locking is a groove located either within said first portion or said second portion, and wherein said second means for locking comprises two spring-loaded collapsible pins located either within said second portion or said first portion respectively and which are adapted to snap into and remain self-locked within said groove.

5,151,105

COLLAPSIBLE VESSEL SLEEVE IMPLANT

Clifford Kwan-Gett, 3017 St. Mary's Cir., Salt Lake City, Utah 84124

Filed Oct. 7, 1991, Ser. No. 772,067
Int. Cl.[5] A61F *2/06*
U.S. Cl. 623—1 **29 Claims**



1. An implantable collapsible tubular sleeve for implanting inside a live tissue fluid vessel, said sleeve comprising an open-ended generally cylindrical body portion being flexible and collapsible, a pair of resilient and substantially circular stiffening members positioned and integral with said sleeve at opposite annular ends of said body, a pair of longitudinal stiffening members extending parallel to a central axis of said sleeve, each member having one end attached to a body portion of the sleeve and opposite ends overlapping and loosely extending from a middle portion of said body for adjusting the length of said sleeve, and means for positioning and erecting said sleeve in said live tissue fluid vessel.

5,151,106

METHOD FOR TINTING A HYDROPHILIC POLYMER BY INCORPORATING A REACTIVE DYE INTO THE POLYMER PRIOR TO POLYMERIZATION

Debabrata Bhaumik, New York, N.Y., and Patrick K. Chen, Edison, N.J., assignors to Allergan, Inc., Irvine, Calif.

Filed Dec. 21, 1990, Ser. No. 632,466
Int. Cl.[5] D06P 5/00
U.S. Cl. 8—507 26 Claims

1. A method for tinting a hydrophilic polymer which comprises:

a) subjecting a hydrophilic polymer-forming composition comprising (i) at least one hydrophilic ethylenically unsaturated monomer, (ii) a reactive dye and (iii) a polymerization initiator which does not chemically affect the reactive dye to polymer forming conditions to provide a hydrophilic polymer in which the reactive dye is substantially uniformly incorporated therein; and,

b) contacting the polymer with an aqueous solution of a base which catalyzes the reaction between the polymer and the reactive dye, the reactive dye thereby becoming covalently bound to the polymer.

5,151,107

CEMENTED AND CEMENTED/SINTERED SUPERABRASIVE POLYCRYSTALLINE BODIES AND METHODS OF MANUFACTURE THEREOF

Hyun S. Cho; Chien-Min Sung, both of Sandy; Leo Merrill, Orem, and Sy-Hwa Chen, Salt Lake City, all of Utah, assignors to Norton Company, Worcester, Mass.

Filed Jul. 29, 1988, Ser. No. 226,049
Int. Cl.[5] B24D 11/00
U.S. Cl. 51—295 47 Claims

1. A superabrasive cutting element comprising a plurality of metal coated superabrasive particles, said superabrasive particles having a hardness at least equal to that of diamond or cubic boron nitride, said metal being selected from Groups IVA, VA, VIA or an alloy thereof; said coating being chemically bonded to said superabrasive particles and to the coatings of adjacent superabrasive particles, said coating forming a matrix cementing said superabrasive particles together into a coherent mass of high structural strength having a predetermined configuration; wherein said superabrasive particles comprise at least 70% by volume of said cutting element.

5,151,108

METHOD OF PRODUCING POROUS VITRIFIED GRINDER

Motohide Kitahara, Kyoto; Hiroshi Ozaki, Osaka, and Kouji Shishido, Mei, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Apr. 3, 1991, Ser. No. 680,142
Claims priority, application Japan, Apr. 5, 1990, 2-90927
Int. Cl.[5] B24D 3/18
U.S. Cl. 51—296 5 Claims

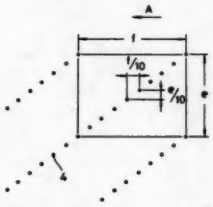
1. A method of producing a porous vitrified grinder comprising: blending melamine cyanurate having a particle diameter of from 100μ to 600μ with grinder grains and at least one binder material to produce a blend; and applying compression molding to the blend.

5,151,109

GRINDER AND METHOD OF MANUFACTURING THE SAME

Hiroyuki Kitabayashi, Neyagawa, and Tadayuki Ishikawa, Hirakata, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Continuation of Ser. No. 42,064, Apr. 24, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 274,748
Claims priority, application Japan, Apr. 28, 1986, 61-96883
Int. Cl.[5] B24D 18/00
U.S. Cl. 51—297 15 Claims



1. A method of manufacturing a grinder comprising the steps of:

forming a grinding particle fixing sheet of a predetermined configuration;

forming an adhesive layer adapted to form a pattern of an adhesive layer on a surface of said sheet;

sprinkling grinding particles each having a predetermined diameter on a surface of said sheet for selectively fixing said grinding particles only on said pattern;

preparing a plurality of sheets fixed with said grinding particles produced by the above described steps; and

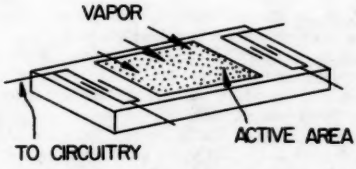
laminating said sheets fixed with said grinding particles one over another according to a predetermined lamination rule, and pressure molding a resulting lamination under a heated condition.

5,151,110

MOLECULAR SIEVE SENSORS FOR SELECTIVE DETECTION AT THE NANOGRAM LEVEL

Thomas Bein; Kelly D. Brown; Gregory C. Frye, and Charles J. Brinker, all of Albuquerque, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Filed Sep. 11, 1990, Ser. No. 580,373
Int. Cl.[5] B01D 53/04
U.S. Cl. 55—75 12 Claims



1. A method of selectively detecting the presence of a chemical entity within an environment comprising placing a selective chemical sensor in said environment and detecting mass changes of the piezoelectric surface resulting from sorption of material thereon, said chemical sensor comprising:

(a) a piezoelectric substrate capable of detecting mass changes resulting from sorption of material thereon; and

(b) a coating applied to said substrate, which selectively sorbs chemical entities of a size less than a preselected magnitude, wherein the chemical entity to be detected is CO or a hydrocarbon,

wherein element (a) is a surface acoustic wave (SAW) device or a quartz crystal microbalance (QCM) device,

wherein element (b) is a film containing zeolite crystals, wherein the pores within said zeolite crystals provide molecule sieving capability, and

wherein said film is an inorganic silica matrix having zeolite crystals embedded therein.

3. A chemical sensor comprising:

(a) a piezoelectric substrate capable of detecting mass changes resulting from sorption of material thereon; and

(b) a coating applied to said substrate, which selectively sorbs chemical entities of a size less than a pre-selected magnitude, wherein the chemical entity to be detected is CO or a hydrocarbon,

wherein element (b) is a film containing zeolite crystals, wherein the pores within said zeolite crystals provide molecule sieving capability, and

wherein said film is an inorganic silica matrix having zeolite crystals embedded therein.

5,151,111

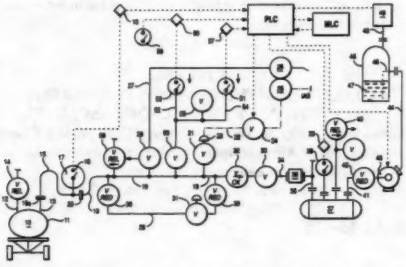
VAPOR RECOVERY SYSTEM FOR VEHICLE LOADING OPERATION

Alistair A. Tees, Nederland, and Glen E. Kenney, Beaumont, both of Tex., assignors to Fina Technology, Inc., Dallas, Tex.

Filed Aug. 2, 1991, Ser. No. 739,545

Int. Cl.[5] B01D *53/00*

U.S. Cl. 55—164 **9 Claims**



1. A vapor recovery system for filling systems in vehicle loading terminals, adapted to collect and remove vapors from vehicles as they are being loaded with volatile substances; said recovery system comprising:

vapor recovery piping adapted to be sealingly connected to a vehicle transport tank;

a vacuum generator attached to said piping and adapted to pull a vacuum in said piping and thereby on said vehicle transport tank;

valving in said piping adapted to control vacuum therein;

actuators on said valving adapted to operate said valving between open and closed positions;

a logic controller connected to said actuators and adapted to activate said actuators to maintain a predetermined desirable level of vacuum in said piping and said vehicle transport tanks in the range of about −4″ to about −12″ W.C.; and,

a vapor collection assembly at the end of said piping arranged to receive said recovered vapor and dispose thereof.

5,151,112

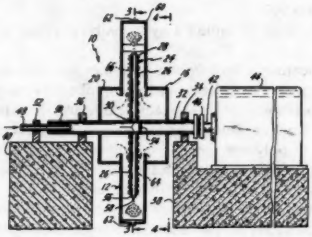
PRESSURE GENERATOR/GAS SCRUBBER

Daniel E. Pike, 19 Jay St., Harrington Park, N.J. 07640

Filed Jul. 24, 1990, Ser. No. 557,616

Int. Cl.[5] B01D *47/00*

U.S. Cl. 55—230 **12 Claims**



1. Apparatus for generating pressure and scrubbing gas comprising:

a casing having a scroll casing;

a gas outlet, tangential to and in fluid communication with said scroll casing, and at least one liquid outlet;

rotating means for generating a positive pressure and for scrubbing gases supplied to said casing, said rotating means including a plurality of radially extending feed tubes positioned in said scroll casing, each tube having an open outlet end and an inlet end;

liquid supply means for supplying liquid to said inlet ends of said feed tubes;

said casing further comprising gas inlet supply means for supplying a gas to said casing at a position adjacent said inlet ends of said feed tubes, wherein said gas supply means includes at least one gas inlet box positioned on one side of said scroll casing and in fluid communication with a central portion of said scroll casing, each said gas inlet box including a gas supply inlet; and

drive means for rotatably driving said rotating means such that said liquid exiting from said feed tubes rotates along a peripheral arc of said scroll casing, and said gas outlet is located in said scroll casing substantially along a tangent to said peripheral arc, wherein said liquid ejected from said open outlet ends of said feed tubes pulls said gas adjacent said inlet ends into scrubbing contact with said liquid and results in formation of said positive pressure at the gas outlet of said casing, with said scrubbed gas exiting through said gas outlet and said liquid exiting through said at least one liquid outlet.

5,151,113

HERBICIDAL 2-(PHENOXY OR PHENYLTHIO)-2-(PYRIMIDINYLOXY OR 1,3,5-TRIAZINYLOXY)-ALKANOIC ACIDS

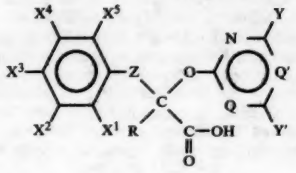
Michael G. Smith; Wendy S. Jacks, both of Walnut Creek; William C. Lo, Hercules, and Robert J. Ehr, Vallejo, all of Calif., assignors to DowElanco, Indianapolis, Ind.

Filed Apr. 29, 1991, Ser. No. 692,742

Int. Cl.[5] A01N *43/54;* **C07D** *239/34, 239/52*

U.S. Cl. 71—92 **36 Claims**

1. A compound of the formula



wherein

one of Q and Q′ represents N and the other represents C—Y″;

Y, Y′, and Y″ each independently represent H, R^1, OR^1, SR^1, NR^2_2, F, Cl, or Br;

X^1 and X^5 each independently represent H, F, Cl, Br, or $(C_1–C_4)$alkyl optionally mono- or disubstituted with fluorine;

X^2 and X^4 each independently represent H, F, Cl, Br, $(C_1–C_4)$alkyl optionally mono- or disubstituted with fluorine, SR^1, OR^1, or O-phenyl, O-pyridinyl, or O-pyrimidinyl each optionally substituted with up to two substituents selected from F, Cl, Br, CF_3, CH_3, and CN;

X^3 represents H or F;

with the proviso that of X^1, X^2, X^3, X^4, and X^5 at least two represent H and at least three represent H or F;

Z represents O or S;

R represents H, $(C_1–C_3)$alkyl, CO_2H, CN, CF_3, or F;

R^1 represents $(C_1–C_3)$alkyl optionally singly to completely substituted with fluorine; and

R^2 represents H or $(C_1–C_3)$alkyl;

or an agriculturally acceptable salt, ester, or amide thereof.

5,151,114

N-SUBSTITUTED-3-(SUBSTITUTED HYDRAZINO)BENZENESULFONAMIDE DERIVATIVES, AND HERBICIDAL COMPOSITIONS

Hideo Arahori, 3-48, Tateato, Ueda-machi, Iwaki-shi Fukushima-ken 974; Shiro Yamazaki, 59-2, Kaneyama, Joubun-Nishigou-machi, Iwaki-shi, Fukushima-ken 974; Masato Arahira, 55-1, Sekishita, Nishiki-machi, Iwaki-shi, Fukushima-ken 974, and Aiko Murakami, 128, Kaminakada, Nishiki-machi, Iwaki-shi, Fukushima-ken 974, all of Japan

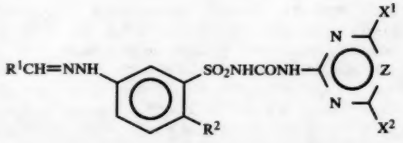
Division of Ser. No. 473,768, Feb. 2, 1990, Pat. No. 5,059,238. This application Mar. 11, 1991, Ser. No. 667,132

Claims priority, application Japan, Feb. 8, 1989, 1-27369

Int. Cl.[5] C07D *403/12*; A01N *43/54*

U.S. Cl. 71—92 **7 Claims**

1. An N-substituted-3-(substituted hydrazino)-benzenesulfonamide derivative of the formula (I):



(I)

wherein R^1 is CF_3, COOH or CCl=CClCOOH, R^2 is H, Cl, $C_1–C_3$ alkyl or $C_1–C_4$ alkoxycarbonyl; Z is CH; X^1 is $C_1–C_3$ alkyl, $C_1–C_3$ akoxyl or Cl; and X^2 is $C_1–C_3$ alkyl or $C_1–C_3$ alkoxyl.

5,151,115

MAGNETIC POWDER FOR MAGNETIC RECORDING MEDIA AND METHOD FOR PRODUCING SAME

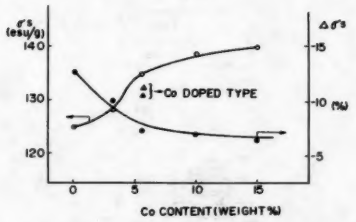
Kiminori Tamai, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 320,254, Mar. 7, 1989, abandoned. This application Oct. 15, 1990, Ser. No. 598,584

Claims priority, application Japan, Apr. 7, 1988, 63-84076

Int. Cl.[5] B22F *1/02*

U.S. Cl. 75—348 **2 Claims**



2. A method for producing a metal magnetic powder for magnetic recording media comprising the steps of providing a hydrous needle-like iron oxide powder not containing cobalt as a starting material wherein the long axis of the hydrous needle-like iron oxide is 0.25–0.50 μm, the short axis of said oxide is 0.015–0.035 μm, and the long axis/short axis ratio is 10–20, processing said powder in an alkaline aqueous solution containing an amount of cobalt ions sufficient for applying cobalt ions to the surface of the powder so that the cobalt content of the powder becomes not less than 6 weight % after reduction, subsequently processing the resultant powder in Na_2SiO_3, and then reducing the resultant powder in a reducing atmosphere, said powder having a coercive force greater than 1300 Oe, but not greater than 1600 Oe.

5,151,116

SORPTION COLUMN FOR WASTE-GAS CLEANING

Christoph Scholz, Scliersee, and Yassilios Sefalidis, München, both of Fed. Rep. of Germany, assignors to CS Halbleiter- und Solartechnologie GmbH, München, Fed. Rep. of Germany

Filed Jan. 29, 1992, Ser. No. 827,410

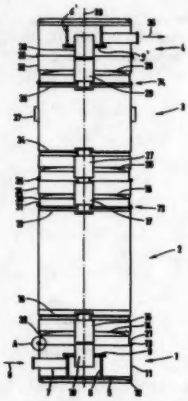
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1991, 4102969

Int. Cl.[5] B01D *53/04*

U.S. Cl. 55—387 **14 Claims**

1. A sorption column for waste-gas cleaning having at least one vat containing a solid, stationary sorbent and connected with a lower gas connecting piece and an upper gas connecting piece, characterized in that the lower gas connecting piece (1) has a coupling member (10), the vat (2, 3) adapted to be placed on the lower gas connecting piece (1) has a valve (17, 29) in the vat cover (16, 28) and a valve (15, 27) in the vat bottom (24, 26), and the upper gas connecting piece (4) has a coupling member (38, 80), whereby the coupling member (10) of the lower gas connecting piece (1) is adapted to be joined with the valve (15) in the vat bottom (14) and the coupling member (38, 80) of the upper gas connecting piece (4) is adapted to be joined with the valve (29) in the vat cover (28), and the valve (15) in the vat bottom (14) and the valve (29) in the vat cover (28) open when joined with the coupling member (10) of the lower

gas connecting piece (1) and the coupling member (38, 80) of the upper gas connecting piece (4), respectively, so as to form



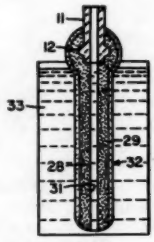
a gas space communicating from the lower gas connecting piece (1) to the upper gas connecting piece (4).

5,151,117

SOLUTION DOPING OF POROUS PREFORMS

Roger F. Bartholomew, Painted Post, and Andrea L. Sadd, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jun. 14, 1991, Ser. No. 715,348
Int. Cl.[5] C03C *25/02*
U.S. Cl. 65—3.12 **10 Claims**



1. A method of making silica-containing glass optical fiber comprising

depositing heated glass particles on an exterior surface of an elongated support where they adhere together to form a porous glass preform having interconnective pores,

removing said support to form a tubular porous glass body,

adding dopant to said porous glass preform by flowing into the pores of said porous glass body a solution of a salt of the dopant dissolved in an organic solvent comprising, an OH-free solvent, said OH-free solvent further comprising 0–30 volume percent of an OH-containing solvent,

removing the organic solvent,

heat treating the porous glass preform to consolidate it into a non-porous glassy body containing the dopant dispersed through at least a portion of the body, and

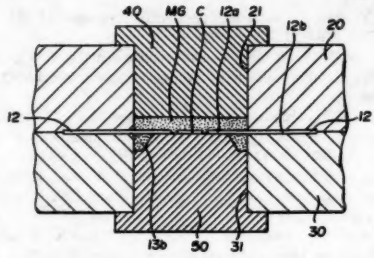
forming an optical fiber from said glassy body wherein the step of depositing comprises introducing one or more reactant compounds into a flame where they are oxidized to form glass particles that are deposited on said support to form said porous glass preform.

5,151,118

METHOD FOR PRODUCING A PACKAGE-TYPE SEMICONDUCTOR ASSEMBLY

Tadao Hirakawa; Sachio Tamura, both of Yokohama, and Hiromitsu Sasanami, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Goto Seisakusho, Yokohama, Japan

Continuation of Ser. No. 458,355, Dec. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 286,724, Dec. 20, 1988, abandoned. This application Oct. 4, 1991, Ser. No. 769,770
Claims priority, application Japan, Jul. 8, 1988, 63-168940
Int. Cl.[5] C03B *19/09*
U.S. Cl. 65—18.1 **4 Claims**



1. A method for producing a package casing for a package-type semiconductor assembly comprising the steps of:

providing at least one straight conductive lead having inner and outer lead sections and first and second lead surfaces;

providing a first mold having first and second end surfaces and a cavity open in the first and second end surfaces;

providing a second mold having first and second end surfaces and a cavity open in the first and second end surfaces of said second mold;

combining said first and second molds together in a manner such that said at least one conductive lead is clamped between said first surfaces of said first and second molds with said inner lead section being exposed in said cavities of said first and second molds and said first lead surface facing said cavity in said first mold and said second lead surface facing said cavity in said second mold;

inserting a first plunger into said cavity in said first mold to a first position spaced from said first lead surface of said inner lead section of said at least one conductive lead to provide an upper space;

inserting a second plunger into said cavity in said second mold to a position in contact with said second lead surface of said inner lead section of said at last one conductive lead;

providing a lower space between said second mold, said second plunger, and a portion of said second lead surface of said at least one lead adjacent said second end surface of said second mold;

placing at least one conductive island in said cavities in adjacent spaced relation to said inner lead section of said at least one conductive lead;

partly filling glass powder into said upper and lower spaces in said cavities of said first and second molds;

melting said glass powder by application of heat;

forcibly moving said first plunger in said cavity in said first mold to a second position closer to but spaced from said first surface of said inner lead section of said at least one conductive lead so that molten glass completely fills said spaces in said cavities; and

solidifying said molten glass by cooling to integrate said inner lead section of said at least one conductive lead and said conductive island in adjacent spaced relation in a unitary glass body.

5,151,119

COOLING OF MOLDED ARTICLES WITH A MIXTURE OF EVAPORATED CRYOGEN AND DRIED AIR

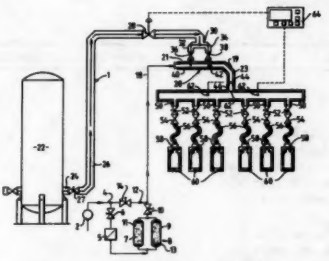
Stephen Clements, Wetherby, and Brian King, Godalming, both of England, assignors to The BOC Group plc, Windlesham, England

Filed Feb. 28, 1991, Ser. No. 663,234

Claims priority, application United Kingdom, Mar. 1, 1990, 9004640

Int. Cl.[5] C03B *9/00*

U.S. Cl. 65—84 8 Claims



1. A method of cooling a plurality of hot glass containers that have been hot shaped and at least partly formed in moulds, comprising the steps of drying a stream of air, passing the dried air into a vacuum-insulated mixing chamber, evaporating liquid cryogen selected from the group consisting of liquid nitrogen and liquid argon in the mixing chamber, allowing the resulting evaporated cryogen to mix with the dried air to form a mixture at a temperature below minus 20° C., passing the cooled gas mixture into a vacuum-insulated manifold, and causing the cooled gas mixture to flow from the manifold and into said glass containers while they are in said moulds.

5,151,120

SOLID INK COMPOSITIONS FOR THERMAL INK-JET PRINTING HAVING IMPROVED PRINTING CHARACTERISTICS

Young S. You, Los Altos, and John D. Meyer, Tracy, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 332,242, Mar. 31, 1989, abandoned, which is a division of Ser. No. 526,210, May 21, 1990, Pat. No. 5,065,167. This application Apr. 12, 1991, Ser. No. 684,632

The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—27 8 Claims

1. An ink-jet composition comprising:

from about 30 to about 94.5 weight percent of a carrier that is solid at 25° C. and liquid at the operating temperature of an ink-jet;

at least about 5 weight percent of an added driver which is miscible with said carrier and which has a critical pressure of at least 15 atmospheres, a boiling point of from about 100° C. to about 300° C. and a vapor pressure at 20° C. of less than about 0.04 atmospheres; and

from about 0.05 to about 5 weight percent of a colorant

wherein said composition is a solid at 25° C., has a viscosity at 90° C. of 15 centipoise or less and has a surface tension at 90° C. of from about 20 to about 25 dynes per centimeter.

5,151,121

SILICATE BINDERS

Thomas Griffiths, Warrington, England, assignor to Unilever Patent Holdings B.V., Rotterdam, Netherlands

PCT No. PCT/GB89/00509, § 371 Date Mar. 13, 1990, § 102(e) Date Mar. 13, 1990, PCT Pub. No. WO89/10819, PCT Pub. Date Nov. 16, 1989

PCT Filed May 11, 1989, Ser. No. 460,875

Claims priority, application United Kingdom, May 13, 1988, 8811411

Int. Cl.[5] C04B *28/26;* B23K *35/22*

U.S. Cl. 106—600 3 Claims

1. In a method of preparing welding rods or sand moulds wherein the components of the rods or moulds are mixed in the presence of an effective amount of a binder, the improvement wherein a lithium silicate solution having a SiO_2:Li_2O weight ratio from about 7.5:1 to about 9:1 and a solids content of from about 18% to about 26% by weight, is used as the sole silicate binder.

5,151,122

PROCESS FOR PRODUCING AN ANTIBACTERIAL CERAMIC MATERIAL

Kiminori Atsumi; Tomoki Saito, and Masaaki Komori, all of Tokyo, Japan, assignors to Kabushiki Kaisha Sangi, Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 611,839

Claims priority, application Japan, Nov. 14, 1989, 1-293992; Aug. 30, 1990, 2-226738

Int. Cl.[5] C09K *3/00;* C09D *5/16;* A23L *1/20, 1/31*

U.S. Cl. 106—35 4 Claims

1. A method of preparing an antibacterial ceramic material comprising contacting at least one ceramic material selected from the group consisting of hydroxyapatite, calcium phosphate, calcium hydrogen phosphate, calcium carbonate, calcium silicate and zeolite with at least one aqueous metal salt selected from the group consisting of aqueous salts of silver, copper and zinc, and thereafter drying and heat firing the material to a temperature of from 800° C. to 1300° C.

5,151,123

RESILIENT SOIL COMPOSITION FOR ATHLETIC FIELDS

Boris Kviesitis, Des Moines, Iowa, assignor to True Pitch, Inc., Altoona, Iowa

Filed May 10, 1990, Ser. No. 521,409

Int. Cl.[5] C09K *17/00*

U.S. Cl. 106—287.17 11 Claims

1. A resilient soil composition for athletic fields which will not become hard and packed upon either drying or being stepped upon and which can be easily worked and shaped, resulting from the method of:

taking a quantity of sand comprised of a plurality of sand particles;

coating said sand particles with a liquid plasticizer material comprised of a mixture of water and at least one from the group of polyvinyl alcohol, polyvinyl acetate, silicon rubber latex or glycerol, and

adding a quantity of clay comprised of a plurality of clay particles, along with a quantity of said plasticizer material to said coated sand particles.

5,151,124

METHOD FOR FORMING AGGREGATED KAOLIN PIGMENT

C. Arlyn Rice, Sandersville, Ga., assignor to ECC America Inc., Atlanta, Ga.

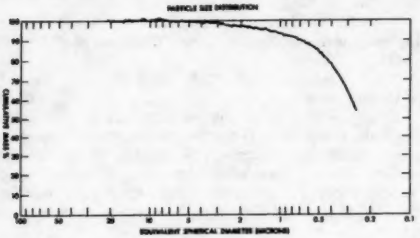
Filed Jun. 4, 1990, Ser. No. 532,598

Int. Cl.[5] C04B *14/00*

U.S. Cl. 106—416 8 Claims

1. A method for forming a hydrothermally aggregated kaolin clay pigment, comprising: preparing an aqueous slurry of a

particulate kaolin clay, sodium silicate, and finely divided calcium carbonate, having a total solids concentration of from about 10 to 20% by weight; the non-aqueous components including 60 to 80 parts per hundred by weight of said kaolin



and from 10 to 20 pph by weight each of said sodium silicate and said calcium carbonate; and hydrothermally treating said slurry in a closed system to form aggregates of adherent kaolin platelets.

5,151,125

AQUEOUS COATING COMPOSITION

Teruaki Kuwajima, Higashiosaka; Shinichiro Umeda, Kyoto; Masakazu Watanabe, Toyonaka, and Sakuichi Konishi, Ikoma, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed May 21, 1991, Ser. No. 703,804

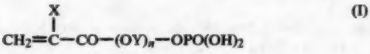
Claims priority, application Japan, May 21, 1990, 2-130862

Int. Cl.[5] C08K *5/00*

U.S. Cl. 106—503 **9 Claims**

1. An aqueous coating composition comprising

(a) an acryl resin having a number average molecular weitht of 1,000 to 50,000, an acid value of 15 to 200 and a hydroxyl value of 20 to 200, prepared by copolymerizing an ethylenic monomer and a phosphate monomer represented by



(I)

wherein X represents a hydrogen atom or a methyl group, Y represents an alkylene group having 2 to 4 carbon atoms and n is an integer of 3 to 30 and

(b) a pigment;

said acryl resin being present in an amount of 2 to 500 parts by weight, based on 100 parts by weight of said pigment.

5,151,126

CEMENT-BASE INJECTION GROUT FOR CONSOLIDATING STRUCTURES

Roger Ranc, Le Teil; Armand Brisset, Le Mee-sur-Seine, and Marcel Debos, Viviers, all of France, assignors to Lafarge Nouveaux Materiaux, Montrouge, France

Filed Aug. 10, 1990, Ser. No. 565,924

Claims priority, application France, Aug. 11, 1989, 89 10836

Int. Cl.[5] C04B *24/00*; E04G *23/02*

U.S. Cl. 106—719 **13 Claims**

1. Cement-based injection grout for consolidating structures affected by fine cracks, comprising a Portland cement finely ground into cement particles, with removal of, as completely as possible, any cement particles of sizes greater than about 12 microns, a water-reducing plasticizer or thinner and water, wherein the water is present relative to the cement in a weight ratio not exceeding 0.6, and the plasticizer or thinner is capable of being present in a proportion of less than 2%.

5,151,127

WEATHER RESISTANT, FIRE RETARDANT PRESERVATIVE AND PROTECTIVE COMPOSITIONS FOR THE TREATMENT OF WOOD AND CELLULOSE PRODUCTS

Duncan C. Thompson, Box 201, Lethbridge, Alberta, Canada T1J 3Y5

Filed Nov. 26, 1990, Ser. No. 617,783

Int. Cl.[5] C09D *5/00*

U.S. Cl. 106—15.05 **9 Claims**

1. A fire retardation and wood preservation composition comprising the following ingredients in the approximate amounts indicated:

Compound	Parts by weight per thousand
Borax	50
Boric acid	30
Urea	100
Magnesium chloride	20
A water-based acrylic resin solution furthur comprising styrene, acrylic acid, hydroxymethylacrylate, ethylene glycol, dimethylaminoethanol, ammonia, and water	75
Triethylamine	10
Carrier water	715

5,151,128

INK, INK JET RECORDING METHOD EMPLOYING THE SAME, AND APPARATUS OR TOOL EMPLOYING THE SAME

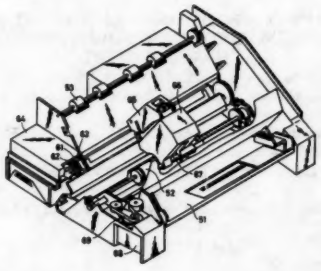
Kyouko Fukushima, Yokohama; Koromo Shirota, Inagi, and Shouji Koike, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1991, Ser. No. 666,076

Claims priority, application Japan, Mar. 9, 1990, 2-058763; Jan. 23, 1991, 3-006384

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—20 **3 Claims**

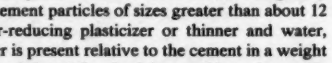


1. An ink comprising

(i) a coloring agent in an amount ranging from 0.2 to 20 wt. % based on the total weight of the ink,

(ii) a liquid carrier medium comprising a mixture of water in an amount ranging from 50 to 95 wt. % based on the total weight of the ink and a water-soluble organic solvent in an amount ranging from 2 to 50 wt. % based on the total weight of the ink, and

(iii) an alkyl ether of a polyoxyethylene-polyoxypropylene random polymer having the following general formula [I]:



[I]

wherein R1 and R2 each is a hydrogen atom or an alkyl group,

with the proviso that they cannot both be a hydrogen atom, and X is a random polymer of (OC_2H_4) and (OC_3H_8) units with a degree of polymerization of 5–32, wherein the (OC_2H_4) units are in a larger proportion than the (OC_3H_6) units, and wherein said alkyl ether is in an amount ranging from 0.01 to 50 wt. % based on the total weight of the ink, said ink having a surface tension ranging from 30 to 68 dyne/cm at 25° C. and a viscosity of 15 cP or less.

5,151,129

PROCESS FOR THE PRODUCTION OF PIGMENTS IN THE PRESENCE OF AN AZO DYESTUFF

Donald J. Morrison; David McGregor, both of Glasgow, and James M. McCrae, Stewarton, all of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 28, 1991, Ser. No. 676,402

Claims priority, application United Kingdom, Mar. 31, 1990, 9007284

Int. Cl.[5] C09B *39/00*

U.S. Cl. 106—623 **23 Claims**

1. A process for the production of a pigment composition comprising precipitating a pigment coupling component from alkaline solution by adding to it an acid, in the presence of a pre-formed, water-soluble azo dyestuff; and subsequently coupling the precipitated coupling component, containing the azo dyestuff, with a pigment diazo or tetrazo component, ensuring that at no time is any substantial amount of uncoupled diazo or tetrazo component present, to form a pigment composition containing the water-soluble azo dyestuff.

5,151,130

AMINE-BASED CONSISTENCY REDUCERS FOR GYPSUM STUCCO SLURRIES

Alan P. Croft, Lake Jackson, and Brian D. Koblinski, Missouri City, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 23, 1991, Ser. No. 644,727

Int. Cl.[5] C04B *11/00*

U.S. Cl. 106—778 **19 Claims**

1. A method for reducing the consistency of a water and stucco slurry comprising admixing water, stucco, and an additive, the additive in an amount effective to reduce the consistency of the admixed slurry as compared to a slurry containing only water and stucco, and the additive comprising one or more polyalkylene polyamines having a molecular weight below 1,000.

5,151,131

CEMENT FLUID LOSS CONTROL ADDITIVES AND METHODS

John Burkhalter, and Jolinda K. Suson, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 26, 1991, Ser. No. 750,151

Int. Cl.[5] C04B *7/02, 24/00*

U.S. Cl. 106—822 **4 Claims**

1. A liquid fluid loss control additive for an aqueous well cement composition wherein said additive consists of:

a liquid hydrocarbon,

an organophilic clay suspending agent present in said additive in an amount in the range of from about 0.5 to about 10 percent by weight of said liquid hydrocarbon,

a surfactant present in said additive in an amount in the range of from about 0.5 to about 8 percent by weight of said liquid hydrocarbon, and

at least one hydrophilic polymer present in said additive in an amount in the range of from about 40 to about 150 percent by weight of said liquid hydrocarbon;

wherein sad liquid hydrocarbon is selected from the group consisting of kerosene, diesel oil, light mineral oil and oils comprised of aliphatic hydrocarbons having in the range of from about 15 to about 19 carbon atoms,

said organophilic clay suspending agent is the reaction product of bentonite clay and an organic quaternary ammonium compound,

said surfactant is selected from the group consisting of aliphatic alcohols having in the range of from about 6 to about 18 carbon atoms reacted with in the range of from about 5 to about 10 moles of ethylene oxide per mole, and octyl, nonyl and dodecyl phenol reacted with in the range of from about 4 to about 20 moles of ethylene oxide per mole, and

said hydrophilic polymer is selected from the group consisting of polysaccharides, polyacrylates, polyacrylamides, xantham gum sulfonated polymers, carboxylated polymers and mixtures of such polymers.

5,151,132

ARRANGEMENT FOR APPLYING SUBSTANCES TO A WEB OF MATERIAL

Johannes Zimmer, Ebentaler Str. 133, A-9020 Klagenfurt, Austria

PCT No. PCT/AT90/00002, § 371 Date Sep. 10, 1990, § 102(e) Date Sep. 10, 1990, PCT Pub. No. WO90/07387, PCT Pub. Date Jul. 12, 1990

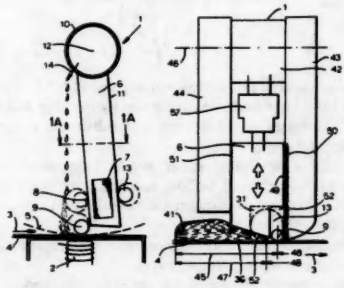
PCT Filed Jan. 5, 1990, Ser. No. 474,838

Claims priority, application Austria, Jan. 9, 1989, 33/89; Sep. 8, 1989, 2112/89

The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.

Int. Cl.[5] B05C *11/04;* B41F *15/44*

U.S. Cl. 118—126 **32 Claims**



1. An arrangement for applying substances to a web of material comprising:

a working magnet positioned below an application surface;

a profiled ledge positioned over said application surface;

a doctor device which is magnetically pressed against said application surface and when in an operating position rests against said profiled ledge; and

at least one restraining magnet which is provided within said profiled ledge for keeping said doctor device in rolling or sliding contact with said profiled ledge and for lifting said restraining magnet off said application surface when said working magnet is switched off.

17. An arrangement for applying substances to a web of material comprising:

a working magnet positioned below an application surface;

a profiled ledge having a front and a rear arm parallel to one another positioned over said application surface;

a doctor device which is magnetically pressed against said application surface by said working magnet in a working position and sealingly pressed against one of said two arms so that escape is prevented of said substances to be applied from an area located in front of said doctor device to an area behind said doctor device when considered in a direction of travel; and

a baffle ledge being vertically movable toward and away from said application surface, said baffle ledge bridging

between said front and rear arms of said profiled ledge, positioned above said doctor device and movable sealingly against at least one of said arms.

5,151,133

VAPOR DEPOSITION APPARATUS

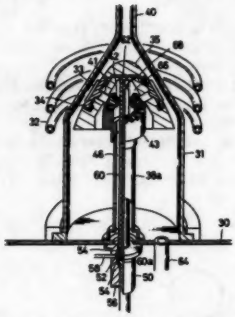
Toshimitsu Ohmine, Tokyo; Keiichi Akagawa, Yamato, and Akira Ishihata, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 181,091, Apr. 13, 1988, Pat. No. 5,002,011. This application Jan. 9, 1991, Ser. No. 639,182

Claims priority, application Japan, Apr. 14, 1987, 62-089715; Sep. 25, 1987, 62-238830; Dec. 8, 1987, 62-308627; Dec. 8, 1987, 62-308758

Int. Cl.[5] C23C *16/00*

U.S. Cl. 118—725 **14 Claims**



1. A chemical vapor deposition apparatus for forming thin films on substrates with reactive gases by rotating and revolving the substrates while heating the substrates in a reactor vessel, comprising:

(a) a hollow susceptor carrier rotatably disposed inside the reactor vessel, said hollow susceptor carrier having an opening on a downstream side in relation to the reactive gas flow;

(b) susceptors rotatably disposed on said susceptor carrier to hold the substrates respectively;

(c) means for rotating said susceptor carrier; and

(d) means located within a hollow of said susceptor carrier for rotating said susceptors with respect to said susceptor carrier.

5,151,134

METHOD AND A DEVICE FOR CLEANING A SURFACE WITH A LASER

Jean-Pierre Boquillon, Dijon; Hubert Berger, Saint Apollinaire, and Philippe Bresson, Dijon, all of France, assignors to Agence Regionale de Developpements Technologiques, Dijon, France

Filed Sep. 14, 1990, Ser. No. 576,464

Claims priority, application France, Jan. 17, 1989, 8900496

Int. Cl.[5] B08B *3/12*

U.S. Cl. 134—1 **19 Claims**

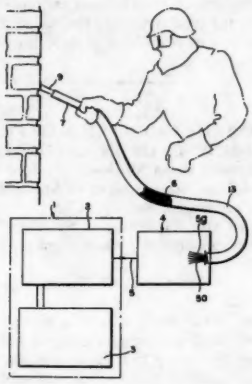
1. Process for removing pollutants from a surface of materials selected from the group consisting of stone, glass, steel, ceramics, wood, paper and cardboard, comprising the steps of:

employing a laser for producing a laser beam comprising laser pulses of high instantaneous pulses which is focused onto the surface to be cleaned;

pulsing the laser in pulse durations not exceeding 30 nanoseconds;

contacting the pulsating laser beam with an area on the surface;

cleaning the surface in the absence of an observable thermal effect to the object; and



removing the laser from the area on the surface after the area is clean.

5,151,135

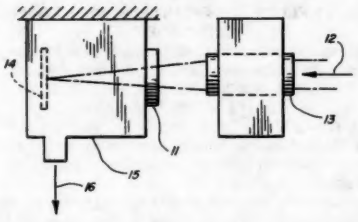
METHOD FOR CLEANING SURFACES USING UV LASERS

Thomas J. Magee, Belmont; Charles S. Leung, and Richard L. Press, both of San Jose, all of Calif., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 15, 1989, Ser. No. 407,817

Int. Cl.[5] H01L *21/268;* **B08B** *7/00*

U.S. Cl. 134—1 **17 Claims**

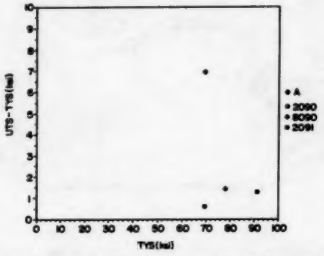


1. A method for treating a solid surface which surface is a member of the group of an essentially single crystalline material, an amorphous material and materials intermediate thereto, said method comprising irradiating said surface with one or more pulses of laser radiation wherein said radiation is essentially ultraviolet and wherein said pulses have a peak-power density that is sufficiently low and a pulse duration that is sufficiently short so that said pulses do not cause substantial chemical or physical change to said surface, and wherein said peak-power density and pulse duration are effective to result in substantial cleaning of said surface.

5,151,136
LOW ASPECT RATIO LITHIUM-CONTAINING ALUMINUM EXTRUSIONS

Jeffrey J. Witters, Pittsburgh, Pa.; Brian A. Chesney, Bettendorf, Iowa, and Roberto J. Rioja, Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 27, 1990, Ser. No. 634,901
Int. Cl.[5] C22F *1/04*
U.S. Cl. 148—689 19 Claims



1. A method of making lithium-containing aluminum base alloy extrusion having at least a section thereof having a low aspect ratio, the extrusions having improved properties in sections thereof having the low aspect ratio, the method comprising:

(a) providing a body of a lithium-containing aluminum alloy having about 0.05 to 1 wt. % Zn;

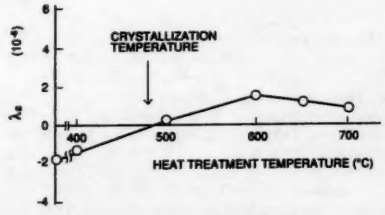
(b) extruding said body into an extrusion including a low aspect ratio section, the aspect ratio being in the range of 1 to 2.5; and

(c) maintaining said body in a temperature range of 400° to 1000° F. and including for said low aspect ratio section at least a 4:1 extrusion reduction during said extrusion step, the low aspect ratio extrusion section having tensile yield strength of at least 60 ksi and having an ultimate yield strength of at least 4.5 ksi greater than the tensile yield strength.

5,151,137
SOFT MAGNETIC ALLOY WITH ULTRAFINE CRYSTAL GRAINS AND METHOD OF PRODUCING SAME

Yoshihito Yoshizawa, Fukaya; Yoshio Bizen; Kiyotaka Yamauchi, both of Kumagaya; Toshikazu Nishiyama, Fukaya, and Shigekazu Suwabe, Kumagaya, all of Japan, assignors to Hitachi Metals Ltd., Tokyo, Japan

Filed Nov. 16, 1990, Ser. No. 614,487
Claims priority, application Japan, Nov. 17, 1989, 1-298878; Feb. 27, 1990, 2-46620
Int. Cl.[5] C22C *19/07*
U.S. Cl. 148—313 23 Claims



8. A magnetic alloy with ultrafine crystal grains having a composition represented by the general formula:

$$Co_{100-x-y-z-a-b}Fe_aM_xB_yX_zT_b \text{ (atomic \%)}$$

wherein M represents at least one element selected from Ti, Zr, Hf, V, Nb, Mo, Ta, Cr, W and Mn, X represents at least one element selected from Si, Ge, P, Ga, Al and N, T represents at least one element selected from Cu, Ag, Au, platinum group elements, Ni, Sn, Be, Mg, Ca, Sr and Ba, $0<a\leqq30$, $2\leqq x\leqq15$, $10<y\leqq25$, $0<z\leqq10$, $0<b\leqq10$, and $12<x+y+z+b\leqq35$, at least 50% of the alloy structure being occupied by crystal grains having an average grain size of 200 Å or less.

5,151,138
BLASTING COMPOSITION AND METHOD

Charles M. Lownds, Johannesburg, South Africa, assignor to Mining Services International Corp., Salt Lake City, Utah

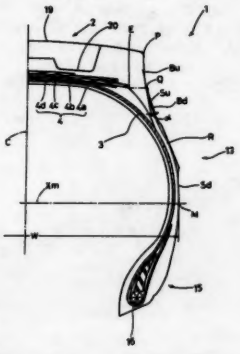
Filed Mar. 26, 1991, Ser. No. 675,142
Int. Cl.[5] C06G *45/02*
U.S. Cl. 149—21 12 Claims

1. A blasting composition for use in boreholes of diameter not less than 80 mm which contains more than about 25% of solid oxidiser particles in the form of dense prills, granules or crystals and at least about 80% of the solid oxidiser particles having a minimum thickness in the range of about 1/200 to about 1/75 of the borehole diameter.

5,151,139
HEAVY DUTY RADIAL TIRE HAVING DURABLE BUTTRESS PORTION

Yoshiyuki Takada, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Mar. 8, 1991, Ser. No. 666,376
Claims priority, application Japan, Mar. 9, 1990, 2-58801
Int. Cl.[5] B60C *3/00, 3/04*
U.S. Cl. 152—454 2 Claims



1. A heavy duty radial tire comprising

a radial carcass having at least one ply of cords extending between bead portions through sidewall portions and a tread portion of the tire,

a tread disposed radially outside the carcass, and

a belt including at least two plies of cords disposed radially outside the carcass and inside the tread,

in a state that the tire is mounted on its regular rim and inflated to its maximum pressure, the tread width between tread edges being not less than 0.73 times the tire maximum width (W), and

the tire profile between a tread edge and a tire maximum section width point including a radially outer part extending between the tread edge and a point Q, a radially inner part extending between the tire maximum section width point and a point R, and a middle part extending between said points Q and R,

said radially outer part being defined by a first circular arc arcing inwardly of the tire, the first circular arc having a

single radius of curvature R2 and a center outside of the tire,

said radially inner part being defined by a second circular arc arcing outwardly of the tire, the second circular arc having a single radius of curvature R1 and a center positioned inward of the tire on an axial straight line (Xm) drawn from the tire maximum section width point,

said point Q being located at a radial height in the range of the edge height of the widest ply of the belt plus or minus 5 mm,

said point R being located at a radial height defined such that the outwardly arcing second circular arc of the radially inner part and the inwardly arcing first circular arc of the radially outer part extended from said point Q to said point R are smoothly connected to each other at said point R as the inflection point therebetween,

said middle part being determined by a straight line (N) extended radially inwardly from said point Q toward said point R inclining axially outwardly at an angle of 4 to 15 degrees with respect to a line tangential to the inwardly arcing first circular arc at said point Q, such that said middle part is located axially outside of said inwardly arcing first arc of the radially outer part extended from said point Q to said point R and such that the distance between said middle part and said straight line (N) extended radially inwardly from said point Q toward said point R, measured normal to said middle part, is not more than 2 mm.

5,151,140

HEAVY-DUTY PNEUMATIC RADIAL TIRE

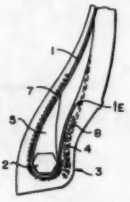
Makoto Takagi, Hiratsuka, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,781

Claims priority, application Japan, Dec. 30, 1988, 63-334896

Int. Cl.[5] B60C *15/06*

U.S. Cl. 152—543 **5 Claims**



1. A heavy-duty pneumatic radial tire having a bead portion comprising a carcass layer having its respective end portions turned up about a bead core from the axially inner side to the axially outer side of the tire and at least two reinforcing layers disposed along a portion of the carcass layer, said at least two reinforcing layers comprises an inner reinforcing layer of steel cords having a layer tenacity of 30 kg/mm of layer width to less than 80 kg/mm of layer width incorporated on the axially inner side of the bead portion and an outer reinforcing layer of steel cords having a greater layer tenacity than the inner reinforcing layer and of at least 80 kg/mm of layer width, incorporated on the axially outer side of the bead portion, wherein the inner reinforcing layer extends from the axially inner side of the bead portion to the axially outer side of the portion and terminates at an area corresponding to the radially inner end of the outer reinforcing layer, wherein cords in the inner reinforcing layer and cords in the outer reinforcing layer are inclined in a same direction relative to the radial direction of the tire, and wherein when mounted on a vehicle the direction of inclination of the cords in the inner and the outer reinforcing layers is opposite to the direction of foward rotation of the tire.

5,151,141

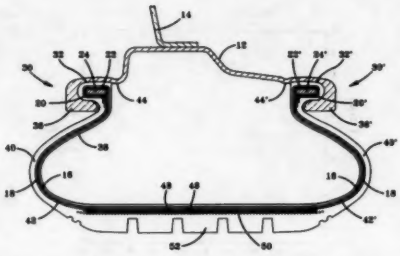
TIRE AND RIM

Chester E. Lunieski, Kent, and Grover W. Rye, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 28, 1991, Ser. No. 676,496

Int. Cl.[5] B60C *15/024, 13/00*

U.S. Cl. 152—544 **11 Claims**



1. A pneumatic tire of the open-torus type and rim assembly, the tire being configured for mounting on the rim assembly, the rim assembly including means for restraining the exterior of the tire at its portion forming the circumferential opening on the radially inner side of its toroidal form, thereby, to restrict radially outward movement of the portions of the tire accessed by such restraining means, the tire comprising:

(a) one or more radial-cord carcass plies extending between two axially spaced apart rim securing regions, the carcass plies in each rim securing region being folded axially and radially outwardly about an annular tensile member and being encased in an elastomeric material, the elastomeric material at the radially inner side of the tire being molded in a shape complementary with that of the restraining means of the rim assembly, thereby, to permit the rim restraining means to restrict radially outward movement of the rim securing regions of the tire engaged from its exterior by the restraining means of the rim;

(b) a belt structure positioned radially outwardly of the carcass plies, the belt structure having axially outermost edges and in one or more plies, cords oriented at both positive and negative angles with respect to the equatorial plane of the tire, the angles being in the magnitude range from 17°–30°, the belt structure providing circumferential restriction of the inflated tire profile;

(c) a tread positioned radially outwardly of the carcass plies and belt structure; and

(d) a sidewall having a flexible sidewall portion adjacent the rim for primary sidewall bending, a stiffer portion radially outward of the flexible sidewall portion, and a thinner cross sectional portion between the stiffer sidewall portion and the outermost edges of the belt structure.

5,151,142

HEAVY DUTY PNEUMATIC RADIAL TIRES USING RUBBER REINFORCING FIBER CORDS WITH IMPROVED ADHESION

Isamu Imai, Tokorozawa; Toshihiro Yotsumoto, Tokyo; Norio Inada, Tokyo; Shigeyuki Toki, Tokyo; Maki Sato, Tokyo, and Ichiro Wada, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 2,466, Jan. 12, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 290,827

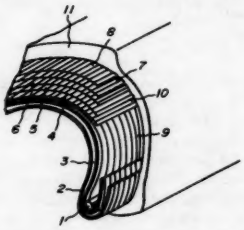
Claims priority, application Japan, Jan. 13, 1986, 61-3571; Jan. 13, 1986, 61-3572; Jan. 13, 1986, 61-5841; Jan. 16, 1986, 61-7733; Sep. 5, 1986, 61-209099

Int. Cl.[5] B60C *9/13, 1/00*

U.S. Cl. 152—565 **4 Claims**

1. A heavy duty pneumatic radial tire comprising at least one pair of bead wires on the right and left, at least one carcass ply

cord layer which is turned up and fixed around each of at least one of the bead wires and has cords arranged at an angle of 75° to 90° with respect to a tire circumferential direction, and at least one belt ply cord layer having cords arranged at an angle of 0° to 30° with respect to the tire circumference direction, wherein at least either one of twisted cords constituting the carcass cord ply layer and twisted cords constituting the belt cord ply layer are each formed by first obtaining a cord through twisting together a plurality of yarns made of at least one kind of fibers selected from the group consisting of aromatic polyamide fibers, entire aromatic polyester fibers and polyvinyl alcohol fibers having a tenacity of not less than 15 g/d or through first twisting yarns to form a cable twist and



then twisting a plurality of thus obtained cable twists; secondly immersing the resulting cord into an impregnating agent consisting essentially of a liquid rubber having a number average molecular weight of 1,000 to 60,000 and finally bonding the cord with an adhesive of a resorcinol-formaldehyde-latex under heating, said liquid rubber being selected from the group of polymers consisting of polybutadiene rubber, polyisoprene rubber, styrene-butadiene rubber, and acrylonitrilebutadiene rubber, terminals of molecular chains of the polymers of the liquid rubber or inner portions of the molecular chains having activating functional groups selected from the group consisting of carboxyl groups, epoxy groups, acrylonitril groups, and isocyanate groups.

5,151,143

MOISTURE-IMPERMEABLE ELECTRIC CONDUCTOR

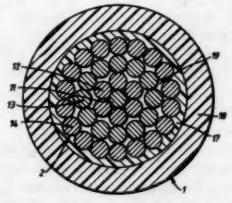
Ian Downie, Brockville, Canada, assignor to Bicc plc, England

Filed May 22, 1991, Ser. No. 703,887

Claims priority, application United Kingdom, May 30, 1990, 9012062

Int. Cl.[5] H01B *13/32*

U.S. Cl. 156—48 **14 Claims**



1. A method of manufacturing an electric cable comprising at least one cable core having a substantially moisture-impermeable multi-wire electric conductor, which method comprises causing a flexible elongate core of metal or metal alloy to travel continuously in the direction of its length; helically winding around the advancing metal core at least one layer of wires to form a flexible multi-wire conductor; extruding over the multi-wire conductor at least one fluid-impermeable layer of plastics material to form an electric cable core; winding the cable core around the hub of a cable drum in such a way that each end of the wound cable core is exposed and accessible; sealing the end of the multi-wire conductor at one exposed end of the wound cable core and evacuating air from the interstices bounded by the wires of the multi-wire conductor from the other exposed end of the wound cable core; connecting a source of semi-conductive moisture-impermeable compound in a liquid or semi-liquid state to the end of the multi-wire conductor at one exposed end of the wound cable core and filling the interstices with moisture-impermeable compound by allowing moisture-impermeable compound to be drawn into and to flow along the interstices throughout the length of the multi-wire conductor until the interstices are substantially filled throughout the length of the conductor and permitting or causing the moisture-impermeable compound in said interstices to thicken to such an extent that it will not readily flow from the conductor.

5,151,144

PROCESS FOR THE MANUFACTURING OF A PERFORATED TUBE FOR AN EXPANSION SHAFT

Otto Chlupsa, Goethestr 52, D-6070 Langen, Fed. Rep. of Germany, assignor to Walter Vetter and Otto Chlupsa, both of, Fed. Rep. of Germany

Filed Jun. 13, 1990, Ser. No. 537,511

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1989, 8907321[U]; European Pat. Off., Jul. 20, 1989, 89113331; Jul. 20, 1989, 89113332

Int. Cl.[5] B65H *81/00*; B31C *13/00*

U.S. Cl. 156—171 **5 Claims**

1. Process for the manufacture of a perforated tube for an expansion shaft, said tube having a longitudinal axis and having apertures to be formed therein, which comprises:

(a) providing a mandrel having a diameter matching the desired inside diameter of said tube and having projections corresponding to apertures to be formed in the perforated tube;

(b) applying to the mandrel a plurality of spaced fiber strata, each comprising long continuous fibers, and one or more honeycomb layers, each honeycomb layer being sandwiched between successive fiber strata so that the fiber strata and the honeycomb layers are in alternating sequence forming a sandwich structure; the fibers of said fiber strata being applied around the projections such that substantially no fibers are severed;

(c) saturating the fiber strata of the sandwich structure with an epoxy resin and allowing the epoxy to harden;

(d) removing a resulting perforated tube from the mandrel

(e) wherein said plurality of spaced fiber strata comprises, from the inner diameter to an outer diameter of the tube, an inside fiber stratum and an outside fiber stratum with a honeycomb layer disposed therebetween, wherein the fibers of said inside and outside fiber stratum are carbon fibers, aramid fibers or a mixture of carbon and aramid fibers and wherein said inside fiber stratum comprises a first fiber layer and a fiber cable layer applied thereto wherein the fibers of said first fiber layer are in the form of a web which comprises a plurality of continuous fibers extending in two directions in crisscross relationship and wherein said fiber cable layer comprises said long continu-

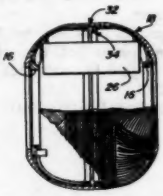
ous fibers, said fibers of said cable being essentially aligned in the axial direction of said tube, and wherein said outside fiber stratum comprises a first fiber layer, a fiber cable layer and an outer fiber band arranged in that order, wherein the fibers of said first fiber layer are in the form of a web which comprises a plurality of continuous fibers extending in two directions in crisscross relationship said first fiber layer being closer to the mandrel that said outer band, and wherein said fiber cable layer comprises said long, continuous fibers, said fibers of said cable being essentially aligned in the axial direction of said tube.

5,151,145

LINER/MANDREL FOR FILAMENT WOUND VESSELS

Alvin R. Cederberg, 2823 N. 74th St., Lincoln, Nebr. 68507

Continuation of Ser. No. 811,633, Dec. 20, 1985, abandoned.
This application Jan. 2, 1990, Ser. No. 456,589
Int. Cl.[5] B32B *5/00*
U.S. Cl. 156—172 **6 Claims**



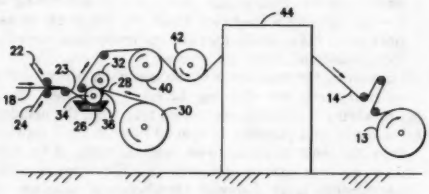
1. A liner for a filament wound vessel, comprising a thin casing fabricated of halves mating at a perimetral joint, reinforcing means formed integrally with the interior of the casing whereby the liner can be used as a mandrel for filament winding or applying composite material to the vessel and a splice ring at said joint, the splice ring being generally cross-shaped in diametral-section, with one leg of the cross centered between the two mating halves of the casing and the two legs of the cross normal to said one leg abutting the inside surfaces of the mating halves along the joint.

5,151,146

METHOD OF MAKING A ROOFING LAMINATE INCLUDING A TRIAXIAL WOUND NONWOVEN FIBERGLASS SCRIM

David E. Green, Mauldin, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 679,194, Apr. 2, 1991, Pat. No. 5,108,831.
This application Jun. 10, 1991, Ser. No. 712,289
Int. Cl.[5] B32B *5/12*
U.S. Cl. 156—177 **1 Claim**



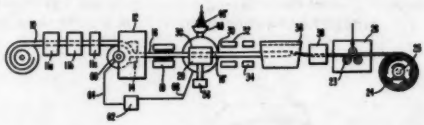
1. The method of manufacturing a roofing membrane comprising the steps of: supplying a triaxially wound nonwoven fiberglass scrim fabric, adhering a nonwoven fiberglass mat to the triaxially wound scrim fabric, supplying a second open mesh nonwoven fiberglass scrim fabric, laminating the second scrim fabric to the triaxial wound scrim fabric and saturating the laminate scrim fabric with a bituminous material to provide a roof membrane.

5,151,147

COATED ARTICLE PRODUCTION SYSTEM

Walter W. Foster, Henrico County; Gregory L. Boatwright, Glen Allen, and Thomas E. Lewis, Richmond, all of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Aug. 17, 1990, Ser. No. 569,356
Int. Cl.[5] B29C *47/02*
U.S. Cl. 156—244.12 **8 Claims**



1. Apparatus for producing polymer coated elongated magnet wire of uniform rectangular cross-section from a supply of metal feed stock, said apparatus comprising:

rotary extrusion press means for receiving incoming feed stock and for continuously extruding magnet wire having a uniform rectangular cross-section;

means for subjecting the extruded magnet wire to a cooling medium to thereby cool the wire to a temperature suitable for receiving a polymeric material coating;

extruding means for extruding a polymeric material into a tube extending around and initially spaced from extruded wire moving through the extruding means, said extruding means including an extrusion die orifice having outwardly bowed sides to reduce the accumulation of excess amounts of polymeric material at corners of the coated magnet wire;

vacuum means for drawing a vacuum within the tube to thereby cause the tube to be pressed into contact with the extruded wire; and

means for controlling the relative speeds of moving of the extruded wire and of the extruding of the polymeric material, said relative speed control means being operable to cause the tube to be drawn down in thickness between where the tube is extruded and where the tube makes contact with the moving extruded wire, thereby reducing the thickness of the polymeric material coated on the extruded wire relative to the initial thickness of the tube when extruded and producing polymer coated elongate magnet wire.

5,151,148

SYSTEM FOR RETREADING TIRES

Robert B. Lindsay, Akron, and Gary C. Parrish, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 357,148, May 26, 1989, Pat. No. 5,055,148.
This application Aug. 27, 1990, Ser. No. 572,290
Int. Cl.[5] B29D *30/56*
U.S. Cl. 156—351 **5 Claims**

1. A tire retreading system comprising:

a fluid pressure chamber for receiving an assembly of a precured tread disposed over a crown portion of a tire casing, and a flexible airtight member for covering the tread and at least a portion of both sidewalls of the tire casing;

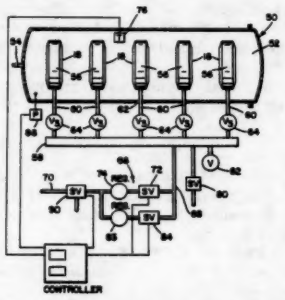
b) a first supply means for supplying fluid pressure to the chamber;

c) a manifold for receiving fluid pressure and for supplying said fluid pressure to said flexible airtight member;

d) a means for venting the manifold;

e) a second supply means for supplying fluid pressure to the manifold, the second supply means being a two stage device having a first and second portion connected in parallel to one another, each portion including a pressure regulator valve and a solenoid valve connected in series;

f) a pressure means for determining a predetermined pressure of the chamber;
g) a temperature means for determining when said fluid pressure of said chamber reaches a predetermined temperature;
h) a controller, the controller including a timing means for determining a predetermined amount of time; and
wherein the system can be operated such that the manifold is vented to the atmosphere until the predetermined temperature of the fluid pressure within the chamber is achieved



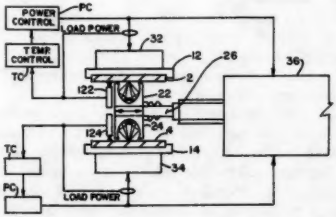
at which point the temperature means senses the temperature and signals the controller to activate the timing means, after a predetermined amount of time the manifold venting means closes and the solenoid valve opens and fluid pressure is received by the manifold the manifold supplying the fluid pressure to the flexible airtight member, the controller and solenoid valves prevent the flexible airtight member from receiving fluid pressure until the chamber has reached or exceeded the predetermined pressure.

5,151,149

APPARATUS FOR BONDING OR MELT FUSING PLASTIC AND PLASTIC MATRIX COMPOSITE MATERIALS

Henry D. Swartz, Newton, Mass., assignor to The Entwistle Corporation, Hudson, Mass.

Continuation of Ser. No. 329,323, Mar. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 225,296, Jul. 28, 1988, abandoned. This application Sep. 5, 1991, Ser. No. 759,055
Int. Cl.[5] B27G *11/02*
U.S. Cl. 156—379.8 **3 Claims**



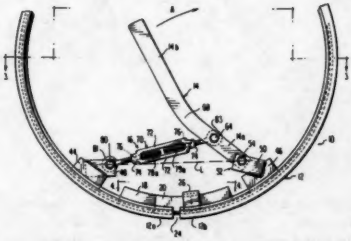
1. An apparatus for bonding two thermoplastic objects comprising:
first means for carrying a first thermoplastic object to be bonded along a predetermined first bonding area;
second means for carrying a second thermoplastic object to be bonded to such first thermoplastic object along a predetermined second bonding area;
heating means for producing a first focused beam of infrared heat impinging upon such first object within substantially only such first bonding area and for producing a second focused beam of infrared heat impinging upon such second object within substantially only such second bonding area;
means for effecting movement of said first and second focused beams relative to and impinging within such first and second bonding areas, respectively, to repeatedly heat such objects within such bonding areas to a melt fusion point; and
means effecting relative movement of said first means and said second means toward one another for joining such first and second objects along such predetermined bonding areas.

5,151,150

MANUALLY CONTRACTABLE RING FOR SEALING AN ENVELOPE AGAINST A BEAD OF A TIRE DURING RETREADING

Archie B. Davis, P.O. Box 134, Aroda, Va. 22709, and Joseph A. Troilo, Jr., P.O. Box 82, Brandy Station, Va. 22714

Filed Dec. 19, 1990, Ser. No. 629,883
Int. Cl.[5] B29D *30/56*
U.S. Cl. 156—384.1 **6 Claims**



1. A manually actuable, contractable split ring assembly for sealing an envelope against a bead of at ire to be retreaded or repaired in an autoclave by pressure and heat treatment, said contractable ring assembly comprising:
a split ring of substantially rigid, elastic material having aligned, first and second overlapping end portions, said end portions being movable relative to each other due to the elastic nature of the ring material to increase the diameter of the split ring to effect sealing action and to decrease the diameter thereof to permit placement and removal of the ring on the tire and about the bead thereof, said ring having a generally cylindrical sealing surface and an axially outer part including a radially extending circumferential lip,
an elongated lever having opposite ends,
means for pivotably mounting one end of said lever to the inner peripheral surface of said split ring adjacent said first overlapping end portion for rotation about a first pivot axis parallel to the axis of the ring,
a turnbuckle having a body with opposite ends,
means for pivotably mounting one end of said turnbuckle body to the inner peripheral surface of said ring at said second overlapping end portion, remote from said pivoted lever for pivoting about a second pivot axis, and the other end of said turnbuckle body to said lever at a point radially outwardly of said lever pivot axis on said ring first overlapping end position to form a toggle linkage, whereby rotation of said lever away from said turnbuckle pivot coupling to said ring second overlapped portion causes said ring to contract in diameter against the bias of the elastic material ring to permit insertion of the ring within the tire side wall opening proximate to said bead, and
wherein release of said lever allows said ring to expand radially under said bias, and pivoting said lever in the opposite direction results in ring expansion to the extent

that said toggle linkage pivot connection of said lever to said turnbuckle moves overcenter of a line between said first and second pivot axes, and

wherein by adjustment of the length of said turnbuckle the maximum expanded diameter of said ring may be preset.

5,151,151

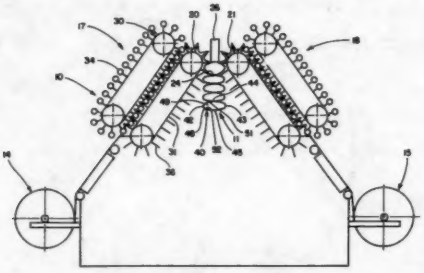
PLEATING MACHINE FOR DUAL FLUTED SHADE

Jamee Kao, 2400 S. Whitehall Dr.-#206Q, Mundelein, Ill. 60060, and Joseph C. S. Hsu, 35 Lane 461 Chung-Shan N. Road Sec. 5, Taipei, Taiwan 111

Continuation-in-part of Ser. No. 24,695, Mar. 11, 1987, Pat. No. 4,795,515, Ser. No. 286,368, Dec. 19, 1988, Division of Ser. No. 145,369, Jan. 19, 1988, Pat. No. 4,871,006. This application Dec. 19, 1988, Ser. No. 286,368

Int. Cl.[5] B32B *3/12*; B65H *37/04*

U.S. Cl. 156—471 **4 Claims**



1. A single machine for making a series of expandable tubular polygons, comprising: means for feeding a first flexible sheet to a first pleating area, means for feeding a second flexible sheet to a second pleating area directly adjacent the first pleating area, first and second pleaters for simultaneously pleating the first and second sheets in the first and second areas so successive pleats in the first sheet are adjacent and aligned with pleats in the second sheet, each of the pleaters having a pleated sheet discharge end directly adjacent a seal area with the discharge ends facing generally toward one another and on opposite sides of the seal area, means for feeding an attachment strip transverse to the first and second sheets, and seal means in the seal area positioned between the first and second pleating areas for attaching the adjacent pleats in the first and second sheets together with the attachment strip to form the series of tubular polygons, said seal means being closely adjacent both of the first and second pleating areas so that the need for pleat supporting and feeding structure between the pleating areas and the seal means is minimized, each of the pleaters having a plurality of conveying and pleat forming elements thereon constructed to hold the sheets in the seal area as the seal means attaches the pleats together.

5,151,152

METHOD FOR MANUFACTURING HEAT-ACTIVATABLE ARTICLES

Helmut Kaeufe, Mettmann, and Christian Kipfelsberger, Hepberg, both of Fed. Rep. of Germany, assignors to RXS Schrumpftechnik-Garnituren GmbH, Fed. Rep. of Germany

Filed Aug. 2, 1989, Ser. No. 388,702

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1988, 3826429

Int. Cl.[5] B29C *61/02*

U.S. Cl. 156—645 **17 Claims**

1. Method for manufacturing heat-activatable articles from a thermoplastic material comprising the steps of:

forming a thermoplastic article into a first shape;

impressing a shape memory on said thermoplastic article by introducing molecular orientations and molecular structures as a result of deformation of said first shape thereby producing a second shape, said article capable of backdeforming from said second shape to said first shape upon application of heat to said article;

removing selected areas of thermoplastic material from said article after having impressed said shape memory to modify at least a portion of the molecular orientations and structures introduced in impressing said shape memory and thereby altering said second shape to form a final shape, said article being capable of deforming to a designated end use shape that differs from said first shape when said article is heated, the difference between said designated end use shape and said first shape resulting from said removal of said selected areas of material from said article; and,

selecting said areas in which said thermoplastic material is removed dependent upon said designated end use shape.

5,151,153

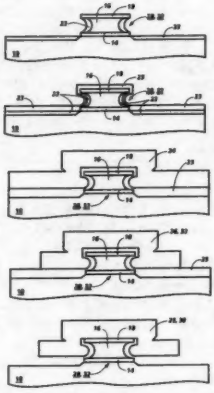
MANUFACTURE OF A SUSPENDED MICROMECHANICAL ELEMENT

Igor I. Bol, Sherman Oaks, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 3, 1991, Ser. No. 725,176

Int. Cl.[5] B44C *1/22*; C03C *15/00*; C23F *1/00*; H01L *21/306*

U.S. Cl. 156—657 **21 Claims**



1. A process for making a micromechanical device on a member comprising:

providing a member having a first generally planar surface and a second generally planar surface extending generally parallel to said first generally planar surface,

wall means extending between and joining said first and second generally planar surfaces,

said wall means having a generally concave surface,

forming a first sacrificial layer on said wall means and at least a portion of said first generally planar surface,

forming a second sacrificial layer on top of said first sacrificial layer and on at least a portion of said second generally planar surface so the second sacrificial layer on said second generally planar surface is thinner than the combined first and second sacrificial layers on said first generally planar surface,

forming a structural layer on top of at least a portion of said second sacrificial layer, and

patterning said structural layer to form a moving structure for movement relative to said member and exposing portions of said sacrificial layer, and

etching and removing said first and second sacrificial layers to release said moving structure from said member and

providing relative movement between said moving structure and said member, whereby said moving structure is spaced from said first generally planar surface and contacts said second generally planar surface.

5,151,154

EVAPORATION ASSEMBLY WITH VAPOR CIRCULATING MEANS

Joaquin Huercanos, Paseo de los Arbustos, 2-1, 20009 San Sebastian, Spain

Filed Oct. 11, 1990, Ser. No. 596,047
Int. Cl.[5] B01D *1/12, 1/22*
U.S. Cl. 159—13.2 11 Claims

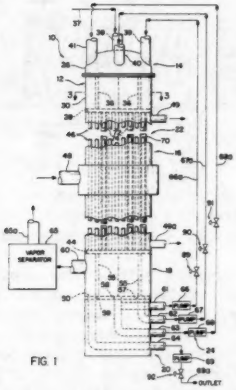


FIG. 1

1. An evaporation assembly for concentrating liquids, comprising:

means for defining an evaporation area;

liquid inlet means, coupled to said evaporation area adjacent one end thereof, for conveying liquid to be concentrated into said evaporation area;

liquid and vapor outlet means, coupled to said evaporation area adjacent an opposite end of said evaporation area, for removing and separating concentrated liquid and vapors from said evaporation area;

heating means, positioned adjacent said evaporating area, for heating liquid conveyed through said evaporation area; and

vapor circulating means, coupled to said liquid and

vapor outlet means and said liquid inlet means, for conveying vapors from said liquid and vapor outlet means to said liquid inlet means and for mixing vapors from said outlet means with liquid to increase velocity of the mixture of liquid and vapors conveyed through said evaporation area.

5,151,155

PROCESS FOR DEINKING WASTEPAPER WITH ORGANICALLY MODIFIED SMECTITE CLAY

Charles A. Cody, Robbinsville, and Edward D. Magauran, Mount Holly, both of N.J., assignors to Rheox, Inc., Hightstown, N.J.

Filed May 9, 1991, Ser. No. 697,448
Int. Cl.[5] D21C *5/02*
U.S. Cl. 162—5 18 Claims

1. A process for deinking wastepaper, which comprises:

(a) contacting wastepaper with an aqueous system which contains an agent in an amount effective to deink the wastepaper, wherein the agent comprises: one or more organically modified smectite-type clays; and

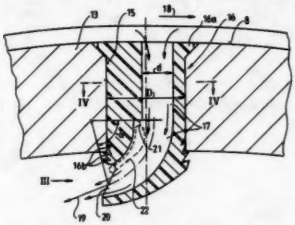
(b) recovering deinked paper pulp from the aqueous system.

5,151,156

SUCTION ROLL WITH DEFLECTOR PIECES IN THE HOLES, FOR A DRYER GROUP OF A PAPER MAKING MACHINE

Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Oct. 23, 1991, Ser. No. 780,632
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1990, 4033597
Int. Cl.[5] D21F *5/00, 5/14*
U.S. Cl. 162—368 16 Claims



1. A suction roll for a dryer group of a paper making machine, the suction roll having a direction of rotation and comprising

an annular roll shell which is rotatable around its axis, the roll shell being provided with a plurality of substantially radial, continuous holes through the shell which are arrayed circumferentially around the shell and at least over the predominant part of the axial length of the shell; the roll shell being hollow and the hollow of the roll shell being connectable with a source of vacuum such that the vacuum source draws suction through the holes in the roll shell;

a respective deflector piece in at least some of the radial holes, each deflector piece including a portion extending a short radial distance inside the annular shell of the roll; each deflector piece including a continuous channel therethrough extending from an end that is toward the radial exterior of the shell toward another end that is radially inside of the shell, the channel extending through the shell in a direction at least substantially parallel to the direction of the respective hole, the portion of the channel radially inward of the roll shell being curved in a direction contrary to the direction of rotation of the roll shell.

5,151,157

HEAT EXCHANGER APPARATUS FOR A MOTOR VEHICLE, HAVING A MAIN HEAT EXCHANGER COMPRISING A WATER BOX CONTAINING A SECONDARY HEAT EXCHANGER

Philippe le Gauyer, Paris, France, assignor to Valeo, Le Mesnil-Saint-Denis, France

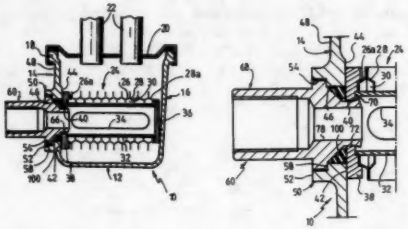
Filed Jul. 31, 1991, Ser. No. 738,675
Claims priority, application France, Jul. 31, 1990, 90 09767
Int. Cl.[5] F28F *9/02*
U.S. Cl. 165—140 9 Claims

1. A heat exchanger apparatus comprising:

a main heat exchanger including a water box having a side wall defining an external face of said water box, said side wall having a pair of access holes formed therethrough;

a secondary heat exchanger within said main heat exchanger, said secondary heat exchanger including two coupling tubes, each of said coupling tubes extending through a respective one of said access holes, whereby said secondary heat exchanger is adapted to be secured within said water box by said coupling tubes, said secondary heat exchanger further including a base ring coaxial

with each of said coupling tubes and having a hole formed therethrough; and



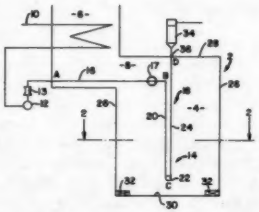
an O-ring seal in an annular space defined between said water box, one of said coupling tubes and one of said base rings.

5,151,158

THERMAL CRACKING FURNACE

Colin P. Bowen, Houston, and John R. Brewer, Katy, both of Tex., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Jul. 16, 1991, Ser. No. 730,560
Int. Cl.[5] C10G 9/20
U.S. Cl. 196—110 **7 Claims**



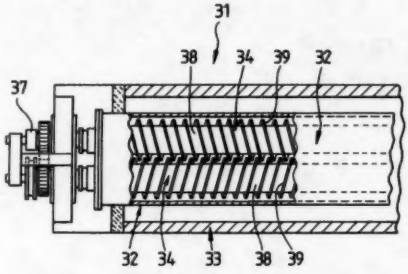
1. A thermal cracking furnace comprising:
a radiant section;
a convection section offset from the radiant section;
a horizontally disposed breeching section extending between the radiant section and the convection section;
a heating means comprising an array of floor burners in the radiant section; and
a plurality of radiant coils extending through the horizontally disposed breeching section and the radiant section, said radiant coils being comprised of a horizontal radiant coil section extending through the horizontal breeching section and vertical coil sections extending through the radiant section wherein the radiant coils of the horizontal breeching section have an internal cross-sectional diameter smaller than the internal cross-sectional diameter of the coils of the vertical coil sections of the radiant coils and the vertical coil sections of the radiant coils are comprised of an upstream and a downstream section wherein the radiant coils in the upstream section of the vertical coil sections have a larger internal cross-sectional diameter than the coils of the horizontal section of the radiant coils and the radiant coils in the downstream section of the vertical sections of the radiant coils have a larger internal cross-sectional diameter than the coils of the upstream section of the vertical section of the radiant coils.

5,151,159

METHOD AND APPARATUS FOR CONVERTING COAL INTO LIQUID FUEL AND METALLURGICAL COKE

Richard A. Wolfe; Chang J. Im, both of Abingdon, Va., and Robert E. Wright, Bristol, Tenn., assignors to Coal Technology Corporation, Bristol, Va.

Filed Nov. 15, 1990, Ser. No. 614,085
Int. Cl.[5] C10B 7/02, 7/10
U.S. Cl. 202—118 **15 Claims**



1. An apparatus for continuously processing coal into gaseous and liquid volatile hydrocarbons and into metallurgical coke suitable for use in a steel industry blast furnace, comprising:
(a) means for crushing said cola into coal particles:
(b) a coal pyrolyzer located subjacent said crushing means for receiving and heating said coal particles to temperatures greater than 800° F., whereby said coal particles are converted to char and volatile hydrocarbon gas, wherein said coal pyrolyzer includes:
(i) a retort chamber externally heated by a gas furnace connected thereto;
(ii) a pair of parallel interfolded drive screws rotatably connected to and encompassed within said retort chamber for conveying said coal particles therethrough;
(iii) means connected to said drive screws for rotating said drive screws, wherein said rotating means intermittently reverses the rotation of said drive screws to prolong the residency of the coal particles conveyed thereby within said retort chamber; and
(iv) a lost motion clutch connected to one of said drive screws and said rotating means for temporarily reducing the angular rotation speed of said one of said pair of drive screws, wherein said drive screws contact concurrently with said reduction in the angular rotational speed of said one of said drive screws to disengage any said coal or char adhering thereto;
(c) means connected to said pyrolyzer for separating said volatile hydrocarbons gas into water vapor, condensable hydrocarbon liquids and non-condensable gases, wherein said gas furnace is connected to said separating means and receives non-condensable gases therefrom for use as a fuel;
(d) means connected to said pyrolyzer for cooling said char to prevent the ignition thereof when exposed to air;
(e) means connected to said cooling means for pulverizing said char;
(f) means connected to said pulverizing means for mixing selected binders with said char;
(g) means connected to said mixing means for compressing said char and said selected binders into briquettes;
(h) means connected to said compressing means for heating said briquettes to temperatures ranging from 1800° F. to 2000° F., thereby calcining said briquettes into metallurgical coke; and
(i) means connected to said heating means for cooling said coke to prevent the ignition thereof when exposed to air.

5,151,160

DEHYDRATION OF 2-METHOXYETHANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 South Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Apr. 6, 1992, Ser. No. 864,229
Int. Cl.[5] B01D *3/40*; C07C *41/42*
U.S. Cl. 203—14 1 Claim

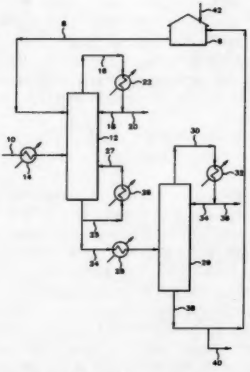
1. A method for recovering water from a mixture of water and 2-methoxyethanol which comprises distilling a mixture of water and 2-methoxyethanol in the presence of about one part of an extractive agent per part of water-2-methoxyethanol mixture, recovering the water as overhead product and obtaining the 2-methoxyethanol and the extractive agent from the stillpot, wherein said extractive agent consists of one material selected from the group consisting of dimethylsulfoxide, dimethylformamide, dimethylacetamide, sulfolane, ethylene glycol, 1,2-butanediol, 1,3-butanediol, 1,4-butanediol, 1,5-pentanediol, hexylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, tripropylene glycol, 2-methyl-1,3-propanediol and polyethylene glycol 200.

5,151,161

SEPARATION OF OLEFINIC HYDROCARBONS BY EXTRACTIVE DISTILLATION

Fu-Ming Lee, and Ronald E. Brown, both of, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 17, 1991, Ser. No. 731,686
The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.
Int. Cl.[5] B01D *3/40*
U.S. Cl. 203—51 13 Claims



1. A process for separating at least one alkadiene containing 4–9 carbon atoms per molecule from at least one alkene containing 4–10 carbon atoms per molecule comprising extractive distillation of a feed which consists essentially of said at least one alkadiene and said at least one alkene employing a solvent consisting essentially of N-methyl-2-thiopyrrolidone;

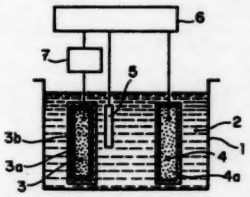
wherein said process produces (i) an overhead product which contains a smaller volume percentage of said at least one alkadiene and a larger volume percentage of said one alkene than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of said at least one alkadiene and a smaller volume percentage of said at least one alkene than said feed; and wherein said at least one alkadiene is separated from said solvent contained in said bottoms product.

5,151,162

RECHARGEABLE STORAGE BATTERY WITH ELECTROACTIVE ORGANIC POLYMER ELECTRODES IN POLAR SOLVENT ELECTROLYTE

Klaus Müller, Carouge-Geneve, and Antonin Kulhanek, Le Lignon, both of Switzerland, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1990, Ser. No. 536,162
Claims priority, application European Pat. Off., Jun. 12, 1989, 89810440.1
Int. Cl.[5] H01M *2/00, 4/00*
U.S. Cl. 294—131 8 Claims



1. A method of conditioning the anode of a battery; comprising:

immersing said anode in a non-aqueous lithium salt solution with a counterelectrode; and

applying a conditioning current to said anode against said counterelectrode,

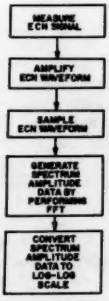
wherein the conditioning current comprises balanced or unbalanced alternating positive and negative pulses and said anode comprises a current collector substrate having deposited thereon at least one polypyrrole layer and at least one layer of ion exchange resin, the polypyrrole layer and the ion exchange resin layer being deposited alternately one over the other.

5,151,163

ELECTROCHEMICAL NOISE MEASUREMENT TECHNIQUE FOR THE DETERMINATION OF ALUMINUM ALLOY PIT INITIATION RATES

James E. Miller, Middletown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 26, 1991, Ser. No. 708,254
Int. Cl.[5] G01N *17/02*
U.S. Cl. 204—153.11 3 Claims


MEASURE ECN SIGNAL
AMPLIFY ECN WAVEFORM
SAMPLE ECN WAVEFORM
GENERATE SPECTRUM AMPLITUDE DATA BY PERFORMING FFT
CONVERT SPECTRUM AMPLITUDE DATA TO LOG-LOG SCALE

1. A method of determining pit initiation rates for an aluminum alloy in an aqueous solution, comprising the steps of:

providing an aqueous solution, said aqueous solution being a halide solution in de-ionized water, whereby a pitting reaction occurs on the surface of the aluminum alloy;

stabilizing the temperature of said aqueous solution;

bubbling dry inert gas through said temperature stabilized aqueous solution to provide a standardized gas content;

measuring electrochemical noise (ECN) signals in the time domain generated by the pitting reaction;

sampling said ECN signal in the time domain to create a digitized ECN signal;

processing said digital ECN signals to generate frequency spectrum amplitude data, including determining a mean value of each ECN signal, and thence subtracting each means value from each respective ECN signal whereby a DC offset is removed from each ECN signal, and thence performing a fast Fourier transform (FFT) after said step of subtracting; and

converting said frequency spectrum amplitude data to a log-log scale wherein the difference between the maximum and minimum spectral levels at the two sides of the frequency spectrum range are indicative of the pit initiation rates.

5,151,164

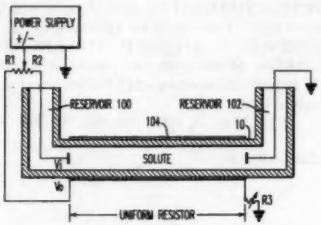
ENHANCED CAPILLARY ZONE ELECTROPHORESIS AND APPARATUS FOR PERFORMANCE THEREOF

William C. Blanchard, Phoenix, and Cheng S. Lee, Columbia, both of Md., assignors to The University of Maryland, College Park and Blanchard and Co., Phoenix, both of, Md.

Filed Feb. 9, 1990, Ser. No. 477,755

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—182.1 **13 Claims**



1. A method of separating elements of a mixture of substances in a solution or suspension by conducting capillary electrophoresis of said solution or suspension, said electrophoresis inducing an electroosmotic flow in said solution or suspension, said method comprising:

1) applying an internal electric field internally along the length of a capillary tube having an interior filled with said solution or suspension bound by a capillary wall,

2) applying an external electric field across the interior of said capillary tube through a conductive member exterior to the interior of said capillary tube,

3) wherein the electric potential difference between the internal and external fields produces an electric field perpendicularly across the capillary wall, along the length of said tube, thereby altering the electroosmotic flow rate, and

4) permitting said solution to undergo electrophoresis under the influence of said electric fields, whereby separation of said elements is optimized.

5,151,165

METHODS AND APPARATUSES FOR PREPARATIVE ELECTROPHORESIS

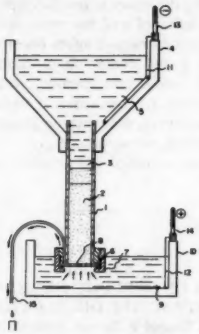
Van T. Huynh, Viry Chatillon, France, assignor to Institut National De La Sante Et De La Recherche Medicale, Paris, France

Continuation of Ser. No. 900,158, filed as PCT/FR85/00357, Dec. 10, 1985, abandoned. This application Apr. 25, 1990, Ser. application Apr. 25, 1990, Ser. No. 513,029

Claims priority, application France, Dec. 11, 1984, 84 18910

Int. Cl.[5] B01D *61/42*; C25D *13/00*

U.S. Cl. 204—299 R **5 Claims**



1. An apparatus for preparative electrophoresis which does not include a pump consisting essentially of

a first zone containing an upper electrode and a first electrode buffer system;

a second zone containing a lower electrode and a second electrode buffer system;

an enclosed means having upper and lower ends connecting said first and second zones, the upper and lower ends of said enclosed means being immersed in said first and second electrode buffer systems, respectively;

a continuous separation gel having an upper and lower surface in said enclosed means the upper surface of the gel on which is placed the sample containing the product to be recovered;

a semi-permeable element having an electroendosmotic capacity maintained tightly and parallel to the lower gel surface;

an elution chamber defined by the lower surface of said gel and said semi-permeable element;

at least one outlet for the removal of products which emerge from the gel, without using a pump, by means of the buffer from the second electrode buffer system flowing in the direction opposite to that of the migration of the products to be separated across said semi-permeable element, said outlet being located between the gel and said semi-permeable element, and being with the gel and the molecules to be separated on the same side of the semi-permeable element, the gel and said semi-permeable element being separated by less than one millimeter.

5,151,166

OXYGEN MONITORING METHOD AND APPARATUS

Michael W. Harral, and Eric L. Rendell, both of Yeovil, England, assignors to Normalair-Garrett (Holdings) Limited, England

Filed Oct. 1, 1990, Ser. No. 591,231

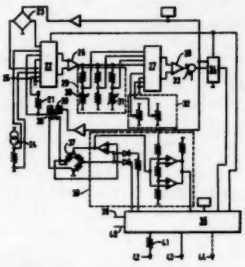
Claims priority, application United Kingdom, Oct. 2, 1989, 8922126

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—425 **14 Claims**

5. Apparatus for monitoring oxygen in oxygen-enriched air delivered by an aircraft on-board oxygen generating system

comprising solid electrolyte amperometric sensor means, means for supplying a sample of oxygen-enriched air to said sensor means whereby a non-linear current signal having a logarithmic relationship with oxygen concentration is output by said sensor means, and means for converting the current signal to a voltage signal, means for converting the voltage



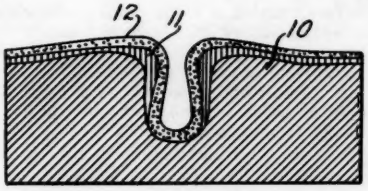
signal from analog to digital signal, means for delivering the digital signal to signal processing means storing an oxygen diffusion equation in the form of a look-up table, said signal processing means being adapted to process the digital signal and output a linear oxygen percentage concentration signal for control and/or warning purposes.

5,151,167

COINS COATED WITH NICKEL, COPPER AND NICKEL AND PROCESS FOR MAKING SUCH COINS

Hieu C. Truong, Orleans, and Maria Dilay, Ottawa, both of Canada, assignors to Royal Canadian Mint, Ottawa, Canada

Continuation of Ser. No. 568,739, Aug. 17, 1990, abandoned. This application Dec. 4, 1991, Ser. No. 801,636
Claims priority, application Canada, Jun. 21, 1990, 2019568
Int. Cl.[5] C25D *5/12, 5/18*
U.S. Cl. 205—102 **14 Claims**



1. A process for making a coin blank or like articles comprising:

a) cleaning a ferrous metal blank so that it will be essentially free of oxide;

b) electroplating said blank with a strike of nickel;

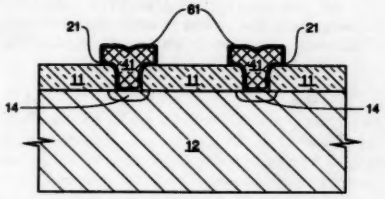
c) electroplating the strike of nickel with a coating of copper by first depositing a thin, initial film of copper at a low current density in a bath that is about 1/6 to ¼ of the full current density and then depositing the remainder of the copper coating at a full current density in the same bath to minimize or avoid bridging of micropores in the ferrous metal blank.

5,151,168

PROCESS FOR METALLIZING INTEGRATED CIRCUITS WITH ELECTROLYTICALLY-DEPOSITED COPPER

Terry L. Gilton; Mark E. Tuttle, and David A Cathey, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Sep. 24, 1990, Ser. No. 587,302
Int. Cl.[5] C25D *5/02*
U.S. Cl. 205—123 **25 Claims**



1. A process for metallizing an integrated circuit chip with copper comprising the following sequence of steps:

forming electrical contact openings in a dielectric layer on the chip;

deposition of a conductive barrier layer on the surface of the chip;

creating a dielectric material mask on top of the barrier layer, said mask being a reverse image of the desired metallization pattern;

submersing the chip in an electrolytic bath having copper ions complexed with EDTA molecules, such that metallic copper is deposited to a desired thickness on portions of the barrier layer that are not covered by said dielectric material mask;

stripping the dielectric material mask; and

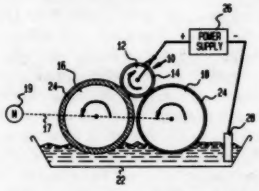
removal of those portions of the barrier layer that were exposed by removal of the dielectric material mask.

5,151,169

CONTINUOUS ANODIZING OF A CYLINDRICAL ALUMINUM SURFACE

George T. Galyon, Fishkill; George M. Jordhamo, Wappingers Falls, and Louis H. Wirtz, Highland, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 6, 1991, Ser. No. 802,792
Int. Cl.[5] C25D *11/04, 17/00*
U.S. Cl. 205—151 **12 Claims**



1. An apparatus for selectively anodizing the peripheral surface of a cylindrical member comprising in combination:

a roller having a peripheral surface;

means for rotating said roller;

means for supporting said member so that said peripheral surface of said member is in contact with the peripheral surface of said roller and said contact causes said member to rotate as said roller rotates;

an electrolyte carried by said peripheral surface of said roller;

a cathode electrically coupled to electrolyte;

a power supply having a positive terminal and a negative terminal; and

means for coupling said negative terminal to said cathode and means for coupling said positive terminal to said cylindrical member.

5,151,170

ACID COPPER ELECTROPLATING BATH CONTAINING BRIGHTENING ADDITIVE

Eda R. Montgomery, and Randal D. King, both of Wilmington, Del., assignors to McGean-Rohco, Inc., Cleveland, Ohio

Filed Dec. 19, 1991, Ser. No. 810,190
Int. Cl.[5] C25D *3/38*
U.S. Cl. 205—298 15 Claims

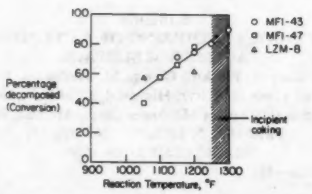
1. An acid copper plating bath for producing smooth copper coatings of high brilliancy containing at least one brightener consisting of a peroxide oxidation product of a dialkylamino-thioxomethyl-thioalkane-sulfonic acid wherein each alkyl and alkane group individually contains from 1 to 6 carbon atoms and wherein the peroxide oxidation of the dialkylamino-thioxomethyl-thioalkanesulfonic acid is carried out in an acid, aqueous medium having a pH of not greater than about 1.

5,151,171

METHOD OF COOLING WITH AN ENDOTHERMIC FUEL

Louis J. Spadaccini; Pierre J. Marteney, both of Manchester, and Meredith B. Colket, III, Simsbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 15, 1991, Ser. No. 701,429
Int. Cl.[5] C10G *11/00*
U.S. Cl. 208—48 Q 11 Claims



1. A method of cooling a heat source, comprising:

(a) transferring thermal energy with heat transfer means from the heat source, which is at a suitable temperature, to an endothermic fuel decomposition catalyst, wherein the catalyst comprises a metal selected from the group consisting of platinum, rhenium, rhodium, iridium, ruthenium, palladium, and mixtures thereof or a zeolite, thereby heating the catalyst to a temperature between about 1000° F. and about 1500° F. to catalytically crack at least a portion of a stream of an endothermic fuel selected from the group consisting of isoparaffinic hydrocarbons, blends of normal and isoparaffinic hydrocarbons, and conventional aircraft turbine fuels; and

(b) contacting the heated endothermic fuel decomposition catalyst with the endothermic fuel stream at a liquid hourly space velocity of at least about 10 hr^{-1}, thereby causing the fuel stream to catalytically crack into a reaction product stream with a conversion of greater than about 60% to produce a total heat sink of at least about 2000 Btu/lb of fuel, wherein the reaction product stream comprises hydrogen and unsaturated hydrocarbons;

thereby cooling the heat source to a temperature less than its original temperature.

5,151,172

DISTILLATE HYDROGENATION

Simon G. Kukes, Naperville; Frederick T. Clark, Wheaton; P. Donald Hopkins, St. Charles, and Lisa M. Green, Geneva, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed May 3, 1991, Ser. No. 695,426
Int. Cl.[5] C10G *45/12*
U.S. Cl. 208—144 25 Claims

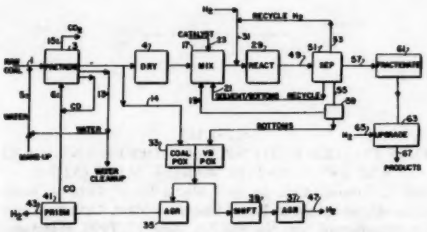
1. A process for hydrogenation of a hydrocarbon feedstock consisting essentially of material boiling between about 150° F. and about 700° F. which comprises reacting said feedstock with hydrogen at hydrogenation conditions in the presence of a catalyst comprising from about 0.1% to about 2.0% by weight each of palladium and platinum and a support comprising mordenite.

5,151,173

CONVERSION OF COAL WITH PROMOTED CARBON MONOXIDE PRETREATMENT

Stephen N. Vaughn, Baton Rouge, La.; Michael Siskin, Livingston, N.J.; Alan Katritzky, Gainesville, Fla.; Glen Brons, Phillipsburg, N.J.; Steve N. Reynolds, Baton Rouge, La.; Claude C. Culross, Baton Rouge, La., and Dan R. Neskora, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 21, 1989, Ser. No. 455,658
Int. Cl.[5] C10G *1/06*
U.S. Cl. 208—430 16 Claims



1. A process for pretreatment of coal preliminary to catalytic hydroconversion of coal material to a hydrocarbonaceous liquid, which process comprises forming in a pretreatment zone a mixture comprising coal, carbon monoxide, solvent and an effective amount of a promoter compound or mixtures thereof, and subjecting the coal containing mixture to a temperature from about 550° F. to 700° F. and a pressure effective to cause hydrogenation and/or depolymerization of the coal, but not to cause solubilization or liquification of said coal, wherein the promoter compound is selected from the group consisting of formic acid, acetic acid, propionic acid, lactic acid, hydrogen sulfide, or an ammonium, alkali or alkali earth metal salt of any of the foregoing acids.

5,151,174

INSTALLATION FOR THE DISINFECTION OF CLARIFIED SEWAGE WITH UV APPARATUS BUILT INTO SIPHONS

Rudolf Wiesmann, Bogenackerstrasse 26, 8630, Tann, Switzerland

Filed Mar. 13, 1991, Ser. No. 668,964
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1990, 4007898
Int. Cl.[5] A61L *9/20*; F04F *10/02*
U.S. Cl. 210—97 11 Claims

5. An installation designed for the disinfection of clarified sewage which is withdrawn from a sewage clarification plant by an open discharge conduit, said installation comprising:

a headwater conduit section of said open discharge conduit having a flow therein;

a low-water conduit section of said open discharge conduit, said low-water conduit section being separated from said headwater conduit section and having a flow therein;

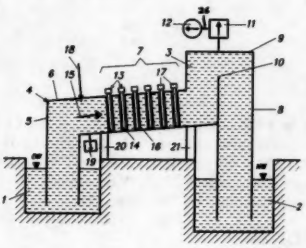
at least one overground tube connecting said two conduit sections, said at least one overground connecting tube being designed as a siphon; and

a UV irradiation source built into said siphon for irradiating the sewage;

said siphon comprising:

an ascending tube comprising a steeply ascending section dipping into the flow in said headwater conduit section;

a soil tube dipping into the flow in said low-water conduit section;



a rising overflow bend comprising a gently ascending tube section defining a reaction chamber and an overflow edge situated higher than said reaction chamber, said rising overflow bend connecting said ascending tube and said soil tube;

said UV irradiation source being built into said gently ascending tube section of said ascending tube.

6. An installation according to claim 5, said overflow bend having an upper side, said installation further comprising:

a vent valve provided at an upper portion of said overflow bend;

a lift pump for evacuating air from said siphon; and

a pipe connecting said vent valve to said lift pump.

7. An installation according to claim 6, said installation further comprising a sensor within said overflow bend for monitoring the water level is said overflow bend, said sensor controlling the operation of said lift pump.

5,151,175

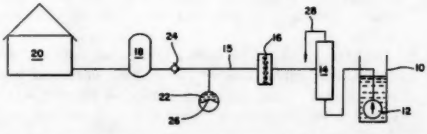
SYSTEM TO AUTOMATICALLY DRAIN FILTER BACKWASH WATER

Claude S. Royal, P.O. Box 2143, Lynchburg, Va. 24501

Filed Jul. 12, 1991, Ser. No. 729,205

Int. Cl.[5] G05D *7/00*; B01D *35/157*; E21B *34/16*

U.S. Cl. 210—108 **3 Claims**



1. A system constructed and arranged for filtering water from a well having a pump, comprising

a supply line having an upstream end connectable to the well and a downstream end connectable to a storage tank,

a check valve in said supply line upstream of the storage tank,

an accumulator containing a compressible fluid and water in communication with said supply line at a point upstream of the check valve,

a filter in said supply line upstream of the accumulator, and

an automatic backwash valve installed in the supply line between the filter and the upstream end of the supply line, said backwash valve having an outlet connected to a drain line, and containing means for automatically directing any water driven backwards through the filter by the accumulator, in response to the pump deactivated, to the drain line, rather than to the pump.

5,151,176

FILTER FOR CONTINUOUS FILTRATION

Kent Strid, Svadenvägen 11, S-810 28 Järbo; Hans Å. Karlsson, Slanstigen 8, S-776 00 Hedemora, and Per Larsson, Gimlestigen 15, S-774 00 Avesta, all of Sweden

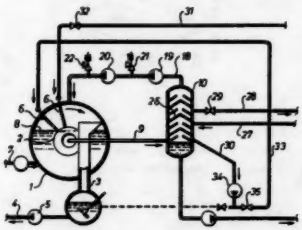
PCT No. PCT/SE90/00413, § 371 Date Apr. 15, 1991, § 102(e) Date Apr. 15, 1991, PCT Pub. No. WO90/15655, PCT Pub. Date Dec. 27, 1990

PCT Filed Jun. 13, 1990, Ser. No. 655,395

Claims priority, application Sweden, Jun. 14, 1989, 8902147

Int. Cl.[5] B01D *33/25*

U.S. Cl. 210—178 **8 Claims**



1. A filter for continuous filtration of a liquid under pressure, said filter including a vessel containing said liquid to a certain level and gas in a gas space located above said liquid, at least one rotatable filter element provided in said vessel and defining an inner space for filtrated liquid obtained by filtration, a washing device for washing material separated from said liquid and deposited on said filter element, communication between said inner space of said filter element and outlet means from said vessel for discharging said filtrated liquid and gas entrained therewith, and a separator connected to said outlet for separating said filtrated liquid from entrained gas, means being provided outside said vessel for generating overpressure in said gas space of said vessel and a lower pressure in said inner space of said filter element at least corresponding to an evaporation temperature of said filtrated liquid in order to maintain said filtrated liquid in a state of evaporation within said separator, said separator being provided with a cooling device for cooling the separated gas and with outlet means for discharging condensate obtained upon cooling.

5,151,177

METHOD AND APPARATUS FOR DISSOLVED AIR FLOTATION WITH AERATION

Mel Roshanravan, Coppell, and Michael W. Grosskopf, Carrollton, both of Tex., assignors to Darling-Delaware Company, Inc., Dallas, Tex.

Filed May 10, 1990, Ser. No. 521,396

Int. Cl.[5] B01D *17/035*; C02F *1/24*

U.S. Cl. 210—194 **19 Claims**

4. Apparatus for aerating water in a dissolved air flotation system, comprising:

flotation container means for receiving waste water and for receiving and retaining aerated waste water to allow flotation of particles to the surface of the waste water held therein;

means for supplying waste water to the flotation container means;

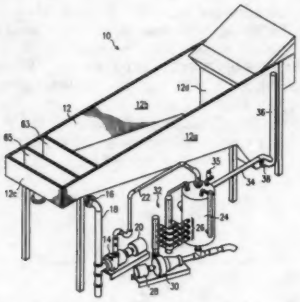
pressure tank means pressurized to a predetermined pressure connected to receive waste water from said flotation container means;

means for pumping waste water from said flotation container means into said pressure tank means;

means for pressurizing said pressure tank means;

aeration means connected to receive waste water from said pressure tank means;

said aeration means comprising: a plurality of jets for entraining air in the waste water as the waste water is forced through the jets;



a water manifold for connecting the waste water from the pressure tank means to the jets;

an air manifold for connecting pressurized air from the pressure tank means to the jets;

connecting means separately connecting each of the jets to the air manifold;

connecting means separately connecting each of the jets to the water manifold; and

means connecting each of the jets to the pressure tank means

means for returning the aerated waste water from the pressure tank means to the flotation container means.

5,151,178

AXIALLY-DRIVEN VALVE CONTROLLED TRAPPING ASSEMBLY

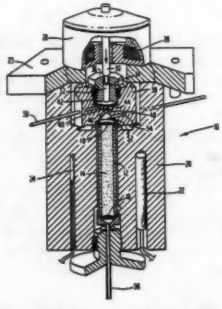
Mark A. Nickerson; John S. Poole, and Lenore G. R. Frank, all of Landenberg, Pa., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 403,024, Aug. 31, 1989, Pat. No. 5,009,778, which is a continuation-in-part of Ser. No. 316,383, Feb. 27, 1989, abandoned. This application Feb. 22, 1991, Ser. No. 659,244

The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.

Int. Cl.[5] **B01D** *15/08*

U.S. Cl. 210—198.2 **4 Claims**



1. In a trapping assembly for use with fluid systems having a vessel at least partially packed with a material for removing a solute component of said fluid, the combination comprising:

an inlet for introducing the fluid under pressure into the trapping assembly;

an axially driven valve for controlling the mass flow of the fluid through the inlet, and

an annular orifice expansion nozzle leading from the valve to the vessel, wherein the valve is actuated and comprises an axially moving pin adapted to restrict the mass flow of the fluid through the valve by varying the size of the annular orifice in the expansion nozzle.

5,151,179

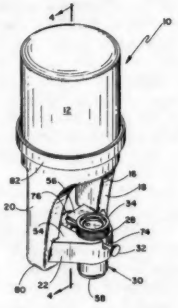
FAUCET CONNECTED WATER FILTER

Ulf-Eiel F. Bach, Mound; Rodney N. Rueter, and John N. Taylor, both of St. Louis Park, all of Minn., assignors to Northland Aluminum Products, Inc., Minneapolis, Minn.

Filed Apr. 20, 1992, Ser. No. 871,140

Int. Cl.[5] **B01D** *35/02, 35/30*

U.S. Cl. 210—250 **7 Claims**



1. A faucet mounted water filter assembly for selecting between filtered and unfiltered water, said purifier comprising:

(a) a filter cartridge housing having a cylindrical shell configuration, said housing containing a filter cartridge therein, said filter cartridge having a filter exit;

(b) a base having an inlet for unfiltered water, an outlet for filtered water, first and second tubular legs projecting below said base, said first leg in fluid communication with the said inlet and having a lower end, said second leg in fluid communication with said outlet and having a lower end;

(c) means on said base for sealing said outlet from said inlet;

(d) a diverter valve support disposed between said lower ends of said tubular legs and connected thereto, said diverter valve support having a valve receiving socket therein; and

(e) a diverter valve received by said socket, said diverter valve having a faucet spout attachment, an unfiltered water exit port, a water outlet port, means to fluidly connect said water outlet port to said first tubular leg and a activator valve for selectively blocking and unblocking said water outlet port to cause water to flow through said unfiltered water exit and through said first tubular leg into said cartridge housing, respectively.

5,151,180

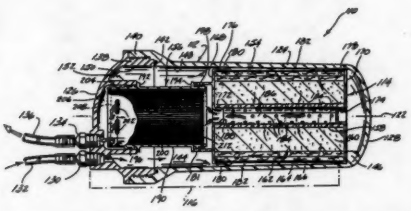
RADIAL AND AXIAL FLOW STAGE FILTER DEVICE

Edward C. Giordano; Mark O'Brien, both of Glastonbury; Raymond M. Petrucci, Middlebury, and Bruce G. Taylor, Kensington, all of Conn., assignors to Cuno, Incorporated, Meriden, Conn.

Continuation-in-part of Ser. No. 422,519, Oct. 17, 1989. This application Oct. 16, 1990, Ser. No. 599,227

Int. Cl.[5] B01D *25/02*

U.S. Cl. 210—264 11 Claims



1. A filter device comprising, a container having a first end wall and a second end wall spaced and joined by a peripheral wall to enclose a cavity, opening means in said container for fluid inlet means and fluid outlet means, a filter unit supported in said cavity, a radial flow first stage subassembly in said filter unit communicating with said fluid inlet means and disposed for radially inward fluid flow, and an axial flow second stage subassembly in said filter unit disposed centrally within said radial flow first stage subassembly in fluid communication with said radial flow first stage subassembly and said fluid outlet means, thereby providing series fluid flow sequentially through said radial flow first stage subassembly and said axial flow second stage subassembly of said filter unit, said radial flow first stage subassembly having a central axial passage receiving said axial flow second stage subassembly, said axial flow second stage subassembly having a hollow outer shell having slot means therein for fluid flow from said central axial passage of said radial flow first stage subassembly into said axial flow second stage subassembly, and said hollow outer shell of said axial flow second stage subassembly having seal means at the longitudinal extremities engaging said radial flow first stage subassembly for maintaining separation of fluids therein except for fluid flow through said slot means.

5,151,181

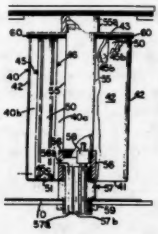
FILTER SYSTEM FOR WET VACUUM CLEANING APPARATUS

Robert M. Barry, St. Paul, Minn., assignor to CFR Corporation, Roseville, Minn.

Filed Mar. 28, 1991, Ser. No. 676,830

Int. Cl.[5] B01D *29/15*

U.S. Cl. 210—338 12 Claims



1. A filter system for wet vacuum cleaning apparatus, said apparatus comprising,

a filter housing having a lower portion and adapted to be mounted in a liquid reservoir tank with the lower portion of the housing disposed below the normal liquid level in the tank, said housing having a top, a bottom, and sidewalls defining a filter chamber therein and having an inlet port disposed below the normal liquid level in the tank,

a filter assembly including a first supporting frame with filter element supported thereon, said assembly being mounted in the chamber and extending from the top to the bottom thereof to divide the chamber into an unfiltered liquid first housing section and a filtered liquid second housing section, said filter element having a sealed connection at the top and bottom of the housing to prevent solids from passing from the first section to the second section,

a pump intake port communicating with the filtered liquid second section,

and wherein the filter supporting frame constitutes a generally cylindrically shaped grid unit, a generally cylindrically shaped filter sleeve removably mounted on said unit and having ends which, with the grid unit, are respectively sealed against the top and bottom of the housing,

a second filter supporting frame concentrically mounted within the first frame and,

a filter element supported on the second frame and having upper and lower ends thereof sealed against the top and bottom of the housing to provide a two stage filter within the housing to provide a double filtered water supply for the pump intake port,

and said first and second filter having a predetermined annular spacing therebetween, and

a plurality of filter positioning posts mounted in said annular spacing for maintaining the alignment of the supporting frames and extending substantially from top to bottom of the chamber, and

a center stand pipe extending from the bottom to the top of said filter housing and having a removable cap connected to the top thereof for engaging the removable top of the housing and securely pressing the same downwardly into sealed engagement with the top of the housing sidewalls and the ends of the filter assemblies.

5,151,182

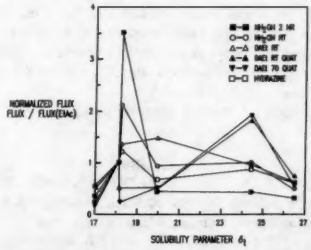
POLYPHENYLENE OXIDE-DERIVED MEMBRANES FOR SEPARATION IN ORGANIC SOLVENTS

Mordechai Perry, Petach Tikva; Henia Yacubowicz, Ness Ziona; Charles Linder, Rehovot; Mara Nemas, Neve Monosson, and Reuven Katraro, Rishon Lezion, all of Israel, assignors to Membrane Products Kiryat Weizmann Ltd., Rehovot, Israel

Filed Aug. 30, 1991, Ser. No. 752,842

Int. Cl.[5] B01D *71/00*

U.S. Cl. 210—500.27 22 Claims



20. A composite membrane comprising a substrate made from polyacrylonitrile, which substrate has been subjected to a stepwise treatment sequence comprising the steps of:

(1) insolubilizing said polymer by crosslinking, comprising treatment with a base selected from organic and inorganic bases, the base-treated polyacrylonitrile substrate then

being subjected to a heat-treatment sub-step at the temperature within the range of about 110°-130° C.;

(2) coating the insolubilized with a layer including at least one polymer selected from polyphenylene oxide type polymers and polysulfone type polymers, as well as at least one polymer derived from haloalkylated polyphenylene oxide type monomers; and

(3) crosslinking said layer by reaction with at least one member selected from the group consisting of ammonia; aliphatic, cycloaliphatic, araliphatic and aromatic amines monoamines and polyamines; hydroxylamine and substituted hydroxylamines; and hydrazine and substituted hydrazines.

5,151,183

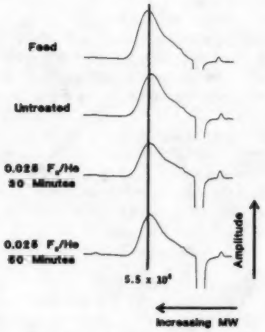
REDUCTION OF MEMBRANE FOULING BY SURFACE FLUORINATION

Robert H. Sedath, Bensenville, Ill.; Donald R. Taylor, Randolph, N.J., and Lloyd S. White, Columbia, Md., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 353,575, May 18, 1989. This application Aug. 23, 1991, Ser. No. 749,097

Int. Cl.[5] B01D *71/68*

U.S. Cl. 210—500.41 **9 Claims**



1. A membrane for removing organic products or impurities from an aqueous waste stream and having improved flux and improved fouling resistance, said membrane being prepared by treating a porous polysulfone membrane having a pore size ranging from 0.001 to 10 μm by the steps comprising:

(a) optionally treating said membrane with an aqueous methanol solution;

(b) drying said membrane;

(c) treating said dried membrane with a mixture of fluorine and an inert gas in an amount and for a period of time sufficient to increase the liquid flux and fouling resistance over that of a non-treated membrane and in the substantial absence of oxygen without significantly altering the pore size of said membrane; and,

(d) exposing said treated membrane to air.

5,151,184

FLUID COLLECTING AND DISPENSING SYSTEM

Michael A. Ferkany, Southfield, Mich., assignor to Biomedical Devices Company, Pontiac, Mich.

Filed Nov. 14, 1990, Ser. No. 613,335

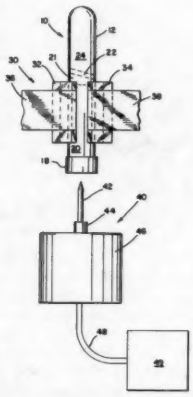
Int. Cl.[5] B01D *17/032, 17/12*

U.S. Cl. 210—514 **4 Claims**

1. A fluid collection system for a plurality of test tubes, the system comprising means for selectively determining the quantity of fluid required to be withdrawn from an individual test tube, wherein the test tube has a closed end and an open end, the open end being sealed by a self-sealing cap, and a fluid collection device which comprises:

a. gripping means for releasibly holding the test tube in a substantially inverted vertical posture such that the sealed open end is situated at the bottom of the test tubes;

b. a fluid collection device positioned below the test tube, the fluid collection device including a penetrating and fluid-extracting needle having a distal and proximal end,



wherein the distal end includes an orifice adapted to penetrate the self-sealing cap of the test tube such that the distal end of the needle barely penetrates the cap of the test tube, and a fluid collection container; and

c. vacuum means connected to the fluid collection device and adapted to create a fluid withdrawing vacuum, a means to selectively control the vacuum means to withdraw a quantity of fluid previously determined to be required for the individual test tube.

5,151,185

LIGHT-LIQUID SEPARATOR

Nikolaus Hammerschmitt, Kölner Str. 138, D-5350 Eurkirchen, Fed. Rep. of Germany

PCT No. PCT/DE90/00429, § 371 Date Mar. 27, 1991, § 102(e) Date Mar. 27, 1991, PCT Pub. No. WO90/14874, PCT Pub. Date Dec. 13, 1990

PCT Filed Jun. 5, 1990, Ser. No. 671,889

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1989, 3918343; Jul. 26, 1989, 3924787; Sep. 11, 1989, 3930226

Int. Cl.[5] C02F *1/40*

U.S. Cl. 210—521 **14 Claims**

1. A light-liquid separator comprising:

a housing provided with an inlet for a mixture including a heavy liquid and a light liquid;

at least one separator chamber operatively connected with a heavy liquid outlet and formed along the path between said inlet and outlet of the housing, said chamber being provided with means forming an overflow edge located above a bottom of said heavy liquid outlet;

a dip tube in said separator chamber extending downwardly from said overflow edge and having a respective inlet above said bottom of said heavy-liquid outlet for pre-separating said light liquid from said heavy liquid in said separator chamber;

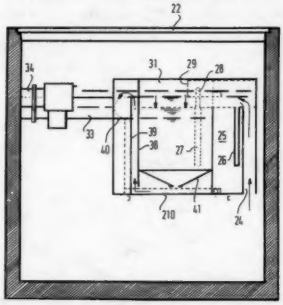
an underflow baffle positioned between said dip tube and said overflow edge;

means forming a light liquid outlet and comprising:

at least one light liquid balance room communicating with said separator chamber through said dip tube and receiving said light liquid and a part of said heavy liquid,

a light liquid discharge reservoir, and

a light liquid discharge tube means extending upwardly from said balance room into said reservoir, wherein said heavy liquid outlet is formed with a flow opening means



located between said bottom and said inlet of the dip tube, for connecting said heavy liquid outlet to said balance room for discharging heavy liquid from said balance room.

5,151,186

METHOD FOR CLEANING FILTER DISKS AND SYSTEM THEREFOR

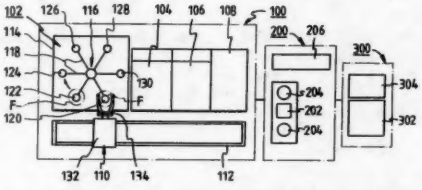
Taek J. Yoo; Yong N. Jang; Wook H. Oh, and Chan S. Jeong, all of Kyongi, Rep. of Korea, assignors to SKC Limited, Suwon, Rep. of Korea

Filed May 16, 1991, Ser. No. 701,679

Claims priority, application Rep. of Korea, May 21, 1990, 90-7259; Oct. 10, 1990, 90-15511

Int. Cl.[5] B01D *35/20*

U.S. Cl. 210—541 **5 Claims**



1. A system for continuously supplying, cleaning and recovering a succession of filter disks which comprises:

a turntable including a plurality of vertical posts capable of holding the filter disks in a stacked condition one above another and a plurality of horizontal arms adapted to support said vertical posts at their free ends, said horizontal arms extending radially outwardly from a common rotational shaft;

a robotic carrier movable along a given path for transporting each of the filter disks from one station to another within said system;

a first ultrasonic cleaner located adjacent to said turntable along the path of said robotic carrier for receiving the filter disk transported from said turntable and ultrasonically cleaning a first side of the filter disk;

a second ultrasonic cleaner positioned adjacent to said first cleaner along the path of said robotic carrier for receiving the filter disk transported from said first cleaner and ultrasonically cleaning a second side of the filter disk;

a water injection cleaner located adjacent to said second cleaner along the path of said robotic carrier for subjecting the filter disk transported from said second cleaner to a pressurized injection of water so as to remove residual contaminants from the ultrasonically cleaned filter disk; and

means for controlling the supplying, cleaning and recovering operations of said system.

5,151,187

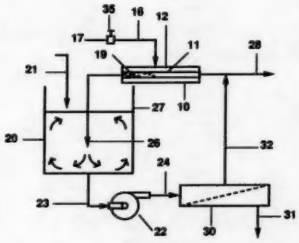
MEMBRANE BIOREACTOR SYSTEM WITH IN-LINE GAS MICRONIZER

Henry Behmann, Puslinch, Canada, assignor to Zenon Environmental, Inc., Burlington, Canada

Filed Nov. 19, 1991, Ser. No. 794,867

Int. Cl.[5] C02F *1/44, 3/12*

U.S. Cl. 210—607 **19 Claims**



9. In a continuous biodegradation process using live microorganisms in an aqueous environment to oxidize dissolved or suspended organic material in a bioreaction zone wherein biomass is aerated, and a portion of said biomass is withdrawn for circulation through a membranous ultrafiltration zone from which a permeate of high quality water is continuously withdrawn, and the remaining solids-containing concentrate is recycled to said bioreaction zone, the improvement comprising,

(a) flowing said solids-containing stream from said membranous zone into a micronizing zone comprising a microporous air diffuser element externally disposed relative to said bioreaction zone;

(b) contacting said solids-containing stream in said micronizing zone, with an oxygen-containing gas at a pressure in the range from about 150–1000 kPa so as to microaerate said stream infusing it with a multiplicity of gas bubbles in the range from 1–1000 μm in diameter, and adding the energy of said gas to the kinetic energy of said solids-containing stream so as to provide a tail-jet leaving said micronizing zone; and,

(c) introducing said tail-jet with sufficient motive force to establish a desired recirculation pattern of solids in said biomass, said motive force being provided by the sum of the energies in said solids-containing stream and said gas stream.

5,151,188

SUPERCRITICAL FLUID EXTRACTION ENHANCER

Marvin L. Hopper, Gladstone, Mo., and Jerry W. King, Peoria, Ill., assignors to The Government of the United States of America, as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Jun. 12, 1990, Ser. No. 536,861

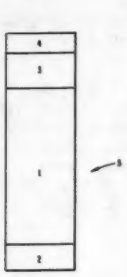
Int. Cl.[5] B01D *11/00, 15/08*

U.S. Cl. 210—634 **16 Claims**

1. A method of preparing a sample for supercritical fluid extraction which comprises:

mixing a sample with an extraction enhancing aid which increases the permeability of the sample to a supercritical extraction solvent and which adsorbs water from the sample, said sample comprising a solid matrix and said

extraction enhancing aid comprising flux-calcined diatomaceous earth; and



retaining the sample mixed with the extraction enhancing aid in an extraction column.

5,151,189

CATIONIC CHARGE MODIFIED MICROPOROUS MEMBRANE

Ho-Pin Hu; Inessa Katsnelson, and Alan Sellinger, all of Ann Arbor, Mich., assignors to Gelman Sciences, Inc., Ann Arbor, Mich.

Filed Sep. 17, 1990, Ser. No. 583,640
Int. Cl.[5] B01D *67/00*
U.S. Cl. 210—635 **38 Claims**

23. A cationic charge modified microporous hydrophilic membrane, comprising:

a microporous membrane substrate comprising polyethersulfone and at least one non-leachable active polymeric additive selected from polyvinylpyrrolidone and polyethylene glycol, which additive enhances hydrophilicity and has functional groups latently reactive with reactive groups of charge modifying agents;

a primary charge modifying agent comprising polyethyleneimine-epichlorohydrin resin which contains polyamines, can chemically react with electrophile-containing compounds and thus impart a net positive charge, and is chemically grafted to said polymeric additive; and

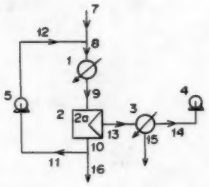
a secondary charge modifying agent containing functionality that is reactive with the primary charge modifying agent, selected from the group consisting of partially phosphinated polyvinylbenzyl chloride ammonium and sulfonium analogs thereof, and quaternized poly(dimethylamine-co-epichlorohydrin) said secondary agent being reacted with the primary agent in an amount either such that the magnitude of the final formal positive charge is increased over that due to its reaction with the primary agent or such that the sensitivity of the primary agent to the variance of environmental pH is decreased.

5,151,190

METHOD FOR SEPARATING A LIQUID MIXTURE

Furuto Seiryo, Tokyo, Japan, assignor to Ryoka Techno Engineering & Construction Co. and Mitsubishi Kasei Corporation, both of Tokyo, Japan

Filed Dec. 27, 1991, Ser. No. 813,783
Claims priority, application Japan, Dec. 27, 1990, 2-408428
Int. Cl.[5] B01D *61/36*
U.S. Cl. 210—640 **11 Claims**



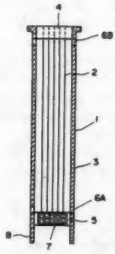
1. A method for separating water by pervaporation from a liquid mixture comprising isopropanol and water, which comprises (a) heating the liquid mixture, then supplying the heated mixture to a pervaporation membrane module unit using a polyimide-type separating membrane to conduct separation of the liquid mixture, recycling a part or whole of the liquid not permeated through the membrane to a feed liquid mixture, supplying a fresh feed liquid mixture to an optional place in the circulation route, and withdrawing the liquid mixture from an optional place in the circulation route, (b) controlling the amount of the liquid to be recycled among the liquid not permeated through the membrane to a level of at least 10 times by volume the amount of the fresh feed liquid mixture, and (c) controlling the difference between the liquid temperature at the inlet of the membrane module unit and the liquid temperature at the outlet of the membrane module unit to a level of at most 20° C.

5,151,191

FILTRATION PROCESS USING HOLLOW FIBER MEMBRANE MODULE

Yoshio Sunaoka, Higashimatsuyama; Keisuke Kitazato, Kumamoto, and Satoru Tsuda, Niiza, all of Japan, assignors to Japan Organo Co., Ltd., Japan

Filed Sep. 11, 1991, Ser. No. 757,857
Claims priority, application Japan, Sep. 26, 1990, 2-254170
Int. Cl.[5] B01D *69/08*
U.S. Cl. 210—644 **4 Claims**



1. A filtration process using a hollow fiber membrane module including a large number of hollow fibers bundled together therein as porous hollow fiber membranes: comprising the filtration step of passing raw water containing fine particles through the pores of said hollow fibers from the outsides thereof to the insides thereof to trap said fine particles on the outer surfaces of said hollow fibers while draining filtrate

obtained on the insides of said hollow fibers out of said hollow fiber membrane module, the cooling step of lowering the temperature of water in said hollow fiber membrane sufficient to substantially reduce roughening of the surfaces and occlusion of the pores of said hollow fiber membranes when vibrated module to cool said porous hollow fiber membranes, the scrubbing step of charging bubbles into water around the outer surfaces of said hollow fibers dipped in water to agitate said water around the outer surfaces of said hollow fibers to vibrate said hollow fibers, thereby exfolidating said fine particles trapped on the outer surfaces of said hollow fibers, and the drain step of draining the resulting waste water containing the exfolidated fine particles out of said hollow fiber membrane module.

5,151,192

METHOD FOR REMOVING HEPARIN FROM BLOOD OR PLASMA

Vlado I. Matkovich, Glen Cove; Peter J. Degen, Huntington; Thomas C. Gsell, Glen Cove; Thomas Bormann, Seaford, and Isaac Rothman, Brooklyn, all of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Jul. 13, 1990, Ser. No. 552,138

Int. Cl.[5] B01D *61/00, 15/00*

U.S. Cl. 210—646 **39 Claims**

1. A method for removing heparin from blood or plasma comprising:

contacting the blood or plasma with a porous medium having a positively charged surface and being capable of removing heparin from blood or plasma without pH adjustment; and

removing heparin from the blood or plasma without substantial removal of blood clotting factors.

5,151,193

POLYMER MEMBRANES ON THE BASIS OF POLYVINYLIDENE FLUORIDE, A PROCESS FOR THE PRODUCTION THEREOF AND THEIR USE

Anneliese Grobe, Esslingen, and Horst Chmiel, Leonberg, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung EV, Fed. Rep. of Germany

PCT No. PCT/DE90/00091, § 371 Date Nov. 2, 1990, § 102(e) Date Nov. 2, 1990, PCT Pub. No. WO90/09232, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 12, 1990, Ser. No. 613,861

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1989, 3904544

Int. Cl.[5] B01D *69/00*

U.S. Cl. 210—651 **35 Claims**

1. A process for the production of polymer membranes on the basis of polyvinylidene fluoride (PVDF), wherein a homogeneous solution L1 containing

a) 5 to 30% by weight of PVDF and

b) 0.01 to 30% by weight of at least one sulfonic acid (PEEKSO$_3$H) salt obtained by sulfonating the polyetheretherketone (PEEK, poly(oxy-1,4-phenyleneoxy-1,4-phenylene-carbonyl-1,4-phenylene)) of formula (I)

$$-(-O-p-C_6H_4-O-p-C_6H_4-CO-p-C_6H_4-)_n- \quad (I)$$

is converted into a membrane by known techniques, and wherein the surface of the membrane is subsequently coated with a film by treating the membrane with a methanolic solution L2 containing 0.1 to 5% by weight of at least one sulfonic acid PEEKSO$_3$H or salt.

5,151,194

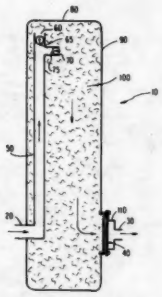
FILTER FOR REMOVING LIQUID HYDROCARBONS FROM WATER AND PROCESS OF REMOVING GASEOUS AND/OR HYDROCARBONS FROM WATER

Stewart A. Simpson, and Rock D. Dicke, both of Spring, Tex., assignors to Hydrocarbon Filtration Systems, Inc., El Campo, Tex.

Filed Oct. 31, 1990, Ser. No. 607,183

Int. Cl.[5] B01D *15/04, 39/04*

U.S. Cl. 210—680 **11 Claims**



1. A packed filter for removing at least one hydrocarbon from water contaminated with said hydrocarbon which comprises a filter casing, an inlet for said contaminated water and an outlet for said contaminated water, said filter casing having contained therein fibrous peat which has been dried to a water content of 5 wt. % or less based on the weight of said peat and the water, which further comprises inside said casing first means oriented to introduce a first stream of said contaminated water into said peat and second means oriented substantially perpendicular to said first means to introduce a second stream of said contaminated water into said peat in a direction substantially perpendicular to said first stream of contaminated water.

5,151,195

FLOTATION-AID COMPOSITION AND METHOD OF USE THEREOF

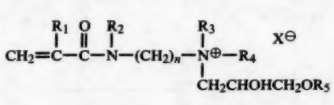
Rudolf S. Buriks, and Allen R. Fauke, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 868,470, May 30, 1986. This application Aug. 11, 1988, Ser. No. 232,822

Int. Cl.[5] B01D *15/00*

U.S. Cl. 210—705 **5 Claims**

1. A method of removing oils, solids and combinations thereof from an aqueous system which comprises the steps of dispersing within said system an effective coalescing amount of a reagent comprising a copolymer of an acrylic compound and a compound of the formula:



wherein

R_1 represents H or CH_3;

R_2 represents H or alkyl radicals having from 1 to about 4 carbon atoms;

R_3 and R_4 each represent an alkyl radical having from 1 to about 6 carbon atoms;

R_5 represents alkyl, alkenyl, cycloalkyl, alkyl substituted cycloalkyl, aryl, aralkyl, and alkaryl radicals having from 2 to about 18 carbon atoms;

n represents an integer from 2 to about 6; and

x represents a negatively charged salt-forming radical to

afford aqueous and non-aqueous layers and removing the non-aqueous layer from the aqueous system.

5,151,196

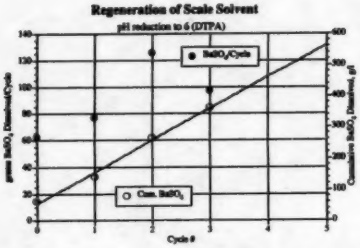
METHOD FOR REGENERATING SCALE SOLVENT

James M. Paul, Dallas, and Richard L. Morris, Duncanville, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Sep. 27, 1991, Ser. No. 766,313

Int. Cl.[5] C02F *1/62*

U.S. Cl. 210—712 **10 Claims**



1. In the method for removing alkaline earth sulfate scale by contacting the scale with an aqueous solvent having a pH of about 10 to about 14 and comprising a chelating agent comprising a polyaminopolycarboxylic acid or salt of such an acid, and a synergist anion selected from the group consisting of anions of at least one monocarboxylic acid, aminoacetic acid and hydroxyacetic acid, oxalates, and thiosulfates; the improvement comprising removing alkaline earth sulfate scale dissolved in said solvent by:

(a) acidifying said solvent with an acidic chelating agent that releases alkaline earth cations which react with sulfate ions present in the solvent to form a precipitate of an insoluble salt of the alkaline earth metal, and

(b) separating the precipitate from the solvent and increasing the pH of the solvent to a pH of about 10 to about 14 to recover a regenerated solvent for reuse to dissolve scale.

5,151,197

FLUID TREATMENT

Alan J. Smith, Hemel Hempstead, and Jennifer J. Quinn, London, both of England, assignors to Thames Water Utilities Limited, United Kingdom

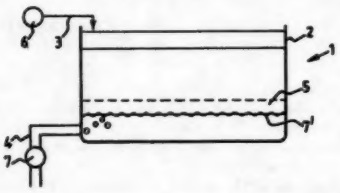
PCT No. PCT/GB90/00235, § 371 Date Dec. 7, 1990, § 102(e) Date Dec. 7, 1990, PCT Pub. No. WO90/09353, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 13, 1990, Ser. No. 576,526

Claims priority, application United Kingdom, Feb. 14, 1989, 8903292

Int. Cl.[5] C02F *1/72*

U.S. Cl. 210—758 **11 Claims**



7. A method of treating fluid, comprising:

(a) providing a treatment vessel containing a bed of inert separable treatment material;

(b) a first supplying step of supplying a fluid to be treated to said bed;

(c) a second supplying step of supplying a treatment fluid to said bed; and

(d) controlling the first and second supplying steps to cause said fluid to be treated to be supplied to said bed in a first pulsed sequence and to cause said treatment fluid to be supplied to said bed in a second pulsed sequence of substantially equal pulse duration to said first pulsed sequence, but opposite to said first pulsed sequence, such that said bed is substantially quiescent with no substantial separation of said material thereof when said fluid to be treated flows into said bed.

5,151,198

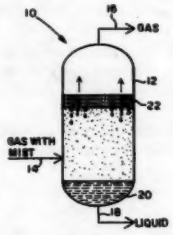
METHOD AND APPARATUS FOR SEPARATING FLUIDS USING A CARBONACEOUS POLYMERIC FILTER HAVING A LOI GREATER THAN 40

Francis P. McCullough, Jr., Lake Jackson, and Stuart D. Stein, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 11, 1990, Ser. No. 581,339

Int. Cl.[5] B01D *39/08, 39/16*

U.S. Cl. 210—767 **17 Claims**



1. In an apparatus for separating fluids, which said apparatus has a fibrous element which permits flow of fluids therethrough and is capable of use in a corrosive atmosphere of non-oxidizing acids, the improvement which comprises said fibrous element being composed of non-graphitic carbonaceous polymeric fibers having an LOI greater than 40, and a carbon content of at least 65% which is the result of an irreversible chemical change whereby an increase of carbon content occurred.

5,151,199

PROCESS AND APPARATUS FOR CONTROLLING FROTH OF AN INSTANT COFFEE BEVERAGE

Jean-Marc Poulin, Chavornay, and Hervé Schmidely, Monthey, both of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Jul. 10, 1990, Ser. No. 550,456

Claims priority, application Switzerland, Jul. 21, 1989, 2738/89

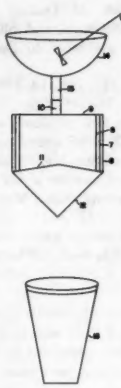
Int. Cl.[5] B01D *29/085*

U.S. Cl. 210—773 **19 Claims**

1. In an apparatus for making and dispensing an instant coffee beverage comprising a mixing bowl and stirrer for mixing water and instant coffee to prepare a coffee beverage and a flow tube connected to the mixing bowl for receiving the coffee beverage from the mixing bowl, the improvement comprising:

at least two screens positioned beneath an end of the flow tube displaced away from the bowl, each screen being in the form of a bag and having an open base and a closed

end, the screens being coaxially and adjacently positioned at a distance from one another, one inside another, for



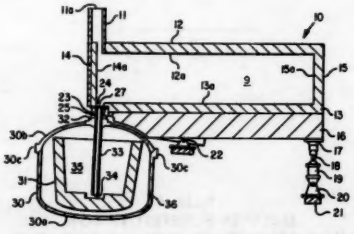
receiving the coffee beverage from the flow tube through their open bases.

5,151,200

HIGH ALUMINIA TAR-IMPREGNATED PRESSURE POURING TUBES

John J. Stephansky, Fair Oaks, Pa., and John P. Sutton, Redmond, Wash., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 258,192, Oct. 14, 1988, abandoned. This application Aug. 9, 1991, Ser. No. 744,676
Int. Cl.[5] B22D *41/54*
U.S. Cl. 222—590 **7 Claims**



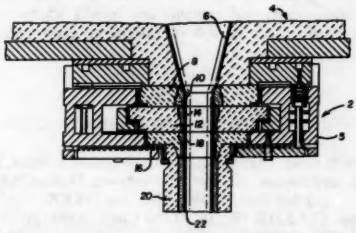
1. A vertical molten metal pressure pouring tube for vertical pressuring pouring of a mold from the bottom thereof wherein molten metal contacts said tube on the interior and exterior surfaces thereof, said tube having a substantially uniform wall thickness; said wall being formed of a carbon impregnated fired refractory composition consisting essentially of alumina and zirconia and wherein residual carbon is retained in said wall when said tube is utilized under oxidizing conditions in bottom pressure pouring of a molten metal under a temperature and pressure which would normally completely oxidize the carbon.

5,151,201

PREVENTION OF EROSION AND ALUMINA BUILD-UP IN CASTING ELEMENTS

Mark K. Fishler, DuPage County; Gilbert Rancoule, Beaver County, both of Ill.; Han K. Park, and Quentin K. Robinson, both of Allegheny County, Pa., assignors to Vesuvius Crucible Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 477,850, Feb. 12, 1990, Pat. No. 5,060,831. This application Jan. 7, 1991, Ser. No. 638,049
Claims priority, application France, Jul. 1, 1988, 8808945
Int. Cl.[5] B22D *41/08*
U.S. Cl. 222—600 **7 Claims**



1. In a slide gate for teeming molten metal from a ladle, tundish or like metallurgical vessel comprising at least one stationary ceramic plate with an orifice therein and at least one movable ceramic plate with an orifice therein such that when the orifices are brought into registry, the gate is open and when the orifices are offset, the gate is closed; the improvement comprising at least one of the ceramic plates comprising:

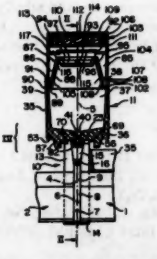
a shape having said orifice therein and adapted to resist oxide build-up during casting operations, said shape prepared from a batch consisting essentially of fused grains analyzing 20 to 50 percent by weight CaO and the remainder ZrO_2 and incidental impurities, said batch formed into said shape and sintered at elevated temperatures to form an oxide bonded structure.

5,151,202

ALUMINOTHERMIC WELDING DEVICE CRUCIBLE AND CRUCIBLE COVER FOR USE THEREWITH

Patrick Bommart, Rueil Malmaison, France, assignor to Delachaux S.A., France

Continuation of Ser. No. 538,149, Jun. 13, 1990, abandoned. This application Sep. 30, 1991, Ser. No. 768,104
Claims priority, application France, Jun. 14, 1989, 89 07872
Int. Cl.[5] B23K *23/00*
U.S. Cl. 249—86 **38 Claims**



1. An aluminothermic welding device for the butt welding of two metal members such as railroad rails comprising:

a crucible defining an aluminothermic reaction chamber and adapted to be used in a predetermined crucible orientation in which the crucible has in its lower portion a discharge aperture opening upwardly into said chamber and down-

ward into a lower external face of the crucible along a predetermined vertical axis of the crucible; and

a mould adapted to be fitted locally onto the two metal members to define therearound a mould cavity in a predetermined mould orientation in which the mould has in its upper portion a pouring bush opening downwardly into said cavity and upwardly into an outer upper face of the mould along a predetermined vertical axis of the mould;

wherein said respective lower face of the crucible and upper face of the mould are formed with mutually complementary respective depressions and reliefs as to enable the crucible to be deposited on the mould to mutually interfit in an operative position in which the crucible and the mould occupy said crucible and mould orientations respectively and in which the discharge aperture and the pouring bush are coaxial.

5,151,203

COMPOSITION AND METHOD FOR CEMENTING A WELL

Wendell D. Riley, Marlow, and Jerry D. Childs, Duncan, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 21, 1991, Ser. No. 718,679

Int. Cl.[5] E21B *33/138, 33/14;* **C04B** *7/353, 24/34*

U.S. Cl. 252—8.551 **21 Claims**

1. A thixotropic cementing composition consisting essentially of hydraulic cement, water, an alkali metal aluminate and an alkali metal halide:

wherein, said aluminate is present in said composition in an amount in the range of from about 0.2 to about 6.0 percent aluminate by weight of said hydraulic cement; said water is present in said composition in amount in the range of from about 35 to about 60 percent water by weight of said hydraulic cement; and said alkali metal halide is present in said composition in an amount in the range of from about a trace up to about 18 percent of said halide by weight water.

5,151,204

OLEAGINOUS COMPOSITIONS CONTAINING NOVEL ETHYLENE ALPHA-OLEFIN POLYMER VISCOSITY INDEX IMPROVER ADDITIVE

Mark J. Struglinski, Bridgewater, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 1, 1990, Ser. No. 473,590

Int. Cl.[5] C08F *210/16;* **C10M** *141/02*

U.S. Cl. 252—52 R **34 Claims**

1. An oleaginous composition comprising oleaginous material and a viscosity modifying effective amount of ethylene alpha-olefin polymer comprising monomer units derived from ethylene and at least one alpha-olefin represented by the formula $H^2C{=}CHR^1$ wherein R^1 is an alkyl group of from 1 to 18 carbon atoms, and wherein said polymer has a number average molecular weight of from above 25,000 to about 500,000, and an average of at least about 30% of the polymer chains contain terminal ethenylidene unsaturation.

5,151,205

CHAIN AND DRIVE GEAR LUBRICANT

Douglas H. Culpon, Jr., Port Neches, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 13, 1991, Ser. No. 698,870

Int. Cl.[5] C10M *129/68*

U.S. Cl. 252—56 R **17 Claims**

1. A lubricating oil composition comprising:

a major portion of a synthetic base lubricating oil,

a solubilizer comprising a trimethylol propane ester of C_6 to C_{12} carboxylic acids; and

2 to 4 wt % of a tackifier comprising a polybutene polymer of molecular weight 100,000 to 1,000,000.

5,151,206

ACICULAR IRON CARBIDE PARTICULATE MATERIAL AND PROCESS FOR PRODUCING SAME

Kazuo Okamura, Itami; Ikuo Kitamura, Kyoto; Hideki Aomi; Satoshi Koyama, both of Osaka; Katsushi Tokunaga, Habikino; Yoshiyuki Shibuya, and Shiego Daimon, both of Osaka, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Division of Ser. No. 918,783, Oct. 14, 1986, Pat. No. 4,842,759, which is a continuation-in-part of Ser. No. 790,238, Oct. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 790,237, Oct. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 909,008, Sep. 16, 1986, abandoned, which is a continuation of Ser. No. 603,080, Apr. 23, 1984, abandoned. This application Mar. 22, 1989, Ser. No. 327,461

The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.

Int. Cl.[5] C01B *31/30*

U.S. Cl. 252—62.51 **4 Claims**

1. A process for producing acicular primary particles having an average axial ratio of 3 to 20 and an average particle size of 0.1 to 2 μm, said particles containing iron carbide, comprising Fe_5C_2 as its main component, as a main component, said process comprising:

mixing acicular particles of τ-Fe_2O_3 having said average axial ratio and said average particle size with an aqueous solution of an alkaline compound having a pH of at least 8;

filtering and drying said mixture to obtain an alkali treated τ-Fe_2O_3; and

contacting said alkali treated τ-Fe_2O_3 with a gas containing a component selected from the group consisting of CO and a mixture of CO and H_2 at a contact temperature of about 250° to about 400° C. at a gas flow rate of CO or a mixture thereof with H_2 of about 1 to 1000 ml(STP)/min per gram of said acicular Fe_2O_3.

2. Acicular, ferromagnetic particles, comprising at least 50 weight percent iron carbide, wherein a majority of the iron carbide is Fe_5C_2, the acicular particles being discrete, acicular particles at a magnification of 3000 to 6000, and having a size of about 0.1 to 2.0 μm, and average axial ratio of about 3 to 20, and a coercivity of at least 850 Oe.

5,151,207

DROP-IN SUBSTITUTE FOR DICHLORODIFLUOROMETHANE REFRIGERANT

George H. Goble, 286 W. Navajo, West Lafayette, Ind. 47906

Filed Jan. 7, 1991, Ser. No. 638,350

Int. Cl.[5] C09K *5/04*

U.S. Cl. 252—67 **6 Claims**

1. A ternary mixture of refrigerants that is a drop-in substitute for dichlorodifluoromethane refrigerant in dichlorodifluoromethane refrigeration systems, comprising about 2 to 20 weight percent isobutane, about 21 to 51 weight percent 1-chloro-1, 1-difluoroethane, and about 41 to 71 weight percent chlorofluoromethane, with the weight percentages of said components being weight percentages of the overall mixture.

5,151,208

DETERGENT POWDERS AND PROCESS FOR THEIR PREPARATION

Gregorius J. Huijben, Vlaardingen; Cornelis G. van Kralingen, Nieuwerkerk a/d/ IJssel; Seeng D Liem, Rhoon, and Michele E. Paoli, Vlaardingen, all of Netherlands, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation of Ser. No. 399,387, Aug. 25, 1989, abandoned, which is a continuation of Ser. No. 180,660, Mar. 29, 1988, abandoned, which is a continuation of Ser. No. 36,610, Apr. 10, 1987, abandoned. This application Mar. 26, 1991, Ser. No. 679,166

Claims priority, application United Kingdom, Apr. 14, 1986, 8609044

Int. Cl.[5] C11D *3/10*

U.S. Cl. 252—174.14 18 Claims

1. A process for the production of a granular solid suitable for use as a detergent powder or a component thereof, comprising the steps of:

(i) preparing an aqueous slurry comprising:

(a) from 8 to 80% by weight of sodium carbonate,

(b) not more than 2% sodium alkaline silicate,

(c) the weight ratio of any sodium bicarbonate to the sodium carbonate not exceeding 1:3;

(ii) adding to the slurry, simultaneously with or later than the addition of the sodium carbonate to sodium sesquicarbonate, the acid being added in an amount of from 0.05 top 0.8 equivalents per mole of sodium carbonate, the resulting slurry having a moisture content of at least 40% by weight;

(iii) drying the resulting slurry to form a powder containing sodium sesquicarbonate in the form of needle-like crystals;

the slurry and the dried powder having a temperature which throughout the process does not exceed 90° C., all percentages being based on the dried slurry.

5,151,209

SHAMPOO COMPOSITIONS

Patrick C. McCall, and Philip E. Cothran, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 316,714, Feb. 28, 1989, abandoned, which is a continuation of Ser. No. 122,986, Nov. 19, 1987, abandoned. This application Feb. 8, 1991, Ser. No. 654,114

Int. Cl.[5] A61K *35/555, 33/04, 31/615, 31/61*

U.S. Cl. 252—174.15 12 Claims

1. A lotion shampoo composition comprising:

(a) from about 10% to about 30% of a synthetic surfactant;

(b) from about 0.1% to about 5.0% of selenium sulfide having an average particle size of less than about 25 μm;

(c) from about 0.001% to about 0.1% of a nonionic polymer to aid in keeping said selenium sulfide particles dispersed in the composition selected from the group consisting of hydroxypropyl methyl cellulose, carboxymethyl cellulose, sodium carboxymethyl cellulose, hydroxyethyl cellulose, and mixtures thereof; and

(d) the remainder water.

5,151,210

SHAMPOO COMPOSITIONS

Christian Steuri, and Theresa B. Williams, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 412,578, Sep. 25, 1989, abandoned, which is a continuation of Ser. No. 266,302, Oct. 31, 1988, abandoned, which is a continuation of Ser. No. 173,020, Mar. 22, 1988, abandoned, which is a continuation of Ser. No. 887,317, Jul. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 856,326, Apr. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 759,612, Jul. 25, 1985, abandoned. This application Jan. 31, 1992, Ser. No. 830,777

Int. Cl.[5] C11D *3/22*

U.S. Cl. 252—174.017 15 Claims

1. A shampoo composition comprising:

(a) from about 15% to about 25% of a synthetic anionic surfactant;

(b) from about 0.1% to about 10% of a dispersed, insoluble, non-volatile silicone or mixtures thereof;

(c) a suspending agent consisting of mixtures of xanthan gum together with long chain acyl derivatives or long chain amine oxides selected from the group consisting of ethylene glycol esters of C_{16}–C_{22} fatty acids, alkanol amides of C_{16}–C_{22} fatty acids, C_{16}–C_{22} alkyl dimethyl amine oxides, and mixtures thereof, the level of xanthan gum being from about 0.25% to about 0.50% of the composition and the level of long chain derivative or long chain amine oxide being from about 1.0% to about 2.0% of the composition; and

(d) the remainder water.

5,151,211

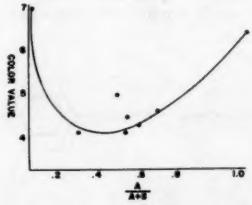
OIL BLEACHING METHOD AND COMPOSITION FOR SAME

David D. Brooks, Crystal Lake; Shirley A. Brophy, Ingleside, and George R. Goss, Quincy, all of Ill., assignors to Oil-Dri Corporation of America, Chicago, Ill.

Division of Ser. No. 280,127, Dec. 5, 1988, Pat. No. 5,004,570. This application Apr. 2, 1991, Ser. No. 679,265

Int. Cl.[5] C11B *3/00*

U.S. Cl. 252—186.1 6 Claims



1. A triglyceride oil bleaching composition suitable for removing color impurities from a triglyceride oil, the composition consisting essentially of an admixture of:

a neutral bleaching clay comprising an attapulgite-smectite clay composition in which the attapulgite-to-smectite weight ratio is in the range of about 0.3:1 to about 1.5:1, and the total weight of attapulgite and smecite is at least 65 weight percent of the clay composition; and

a chelating polycarboxylic acid having an even number of carboxyl groups, said carboxyl groups being paired, and the carboxyl groups in each pair being available to form an eclipsed configuration.

5,151,212

PEROXYGEN COMPOUND ACTIVATION

Jack H. Bell, West Paterson; Henry C. Zak, Great Notch, and Dominick A. De Santis, Somerville, all of N.J., assignors to The Belzak Corporation, Clifton, N.J.

Filed Mar. 21, 1990, Ser. No. 496,608
Int. Cl.[5] C09K 3/00
U.S. Cl. 252—186.38 110 Claims

1. A peroxygen composition comprising:

(a) at least one peroxygen bleaching compound selected from the group consisting of peroxyacids and alkali metal peroxygen bleaching compounds; and

(b) at least one polyhydric activator compound, substantially free of ester or ether hydroxyl group derivatives, said polyhydric activator compound having at least four carbon atoms, each of said carbon atoms having at least one hydroxyl group bonded thereto,

wherein said polyhydric activator compound is uncomplexed or in the form of a metal complex, said metal being selected from the group consisting of boron and aluminum.

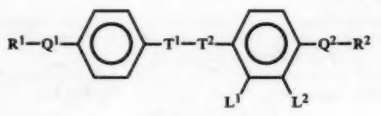
5,151,213

FLUORINE-CONTAINING AROMATIC COMPOUNDS

Volker Reiffenrath, Rossdorf, and Ulrich Finkenzeller, Plankstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jul. 18, 1990, Ser. No. 553,808
Int. Cl.[5] C09K 19/06, 19/30, 19/52
U.S. Cl. 252—299.6 6 Claims

1. A fluorine-containing aromatic compound of formula I



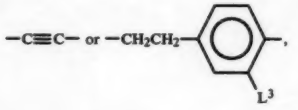
I

wherein

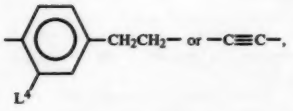
R^1 is C_{1-12}-alkyl or C_{1-12}-alkenyl,

Q^1 and Q^2 are each independently —O— or a single bond, or one of Q^1 and Q^2 is trans-1,4-cyclohexylene,

T^1 is



T^2 is



R^2 is F, Cl, $—CF_3$, $—OCF_3$, $—OCHF_2$ or one of the meanings of R^1, and

L^1, L^2, L^3 and L^4 are each independently H or F, with the proviso that one and only one of T^1 and T^2 is —C≡C—.

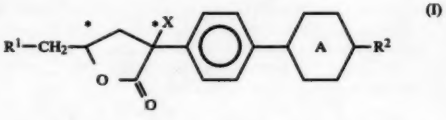
5,151,214

FERROELECTRIC LIQUID CRYSTAL DEVICE

Mitsuhiro Kodes; Tomoaki Kuratate, both of Nara; Fumiaki Funada, Yamatokoriyama; Kazuhiko Sakaguchi, Toyonaka, and Tohru Kitamura, Kyoto, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 4, 1990, Ser. No. 592,909
Claims priority, application Japan, Oct. 6, 1989, 1-262789
Int. Cl.[5] C09K 19/34, 19/12; G02F 1/13
U.S. Cl. 252—299.61 7 Claims

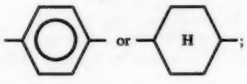
1. A ferroelectric liquid crystal device comprising a pair of substrates each provided with voltage applying means, at least one of the substrates having an orientation control layer, and a ferroelectric liquid crystal layer disposed between the pair of substrates, the ferroelectric liquid crystal layer comprising at least one compound represented by the following general formula (I):



(I)

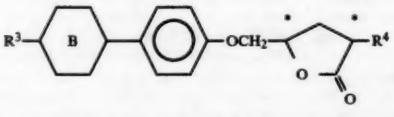
wherein R^1 and R^2 may be identical or different from each other and independently represent an alkyl group or an alkyloxy group, having 1 to 15 carbon atoms with straight or branched chains;

represents



X represents a hydrogen atom or a methyl group, and * represents that the carbon atom is asymmetric,

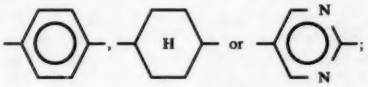
and at least one compound represented by the following general formula (II):



(II)

wherein R^3 and R^4 may be identical or different from each other and independently represent an alkyl group, having 1 to 15 carbon atoms with straight or branched chains;

represents



and * represents that the carbon atom is asymmetric.

5,151,215

PRE-WATER-BASED SUSPENSION ALUMINA COATED PHOSPHOR TREATMENT PROCESS

A. Gary Sigai, Lexington, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Continuation-in-part of Ser. No. 746,162, Aug. 14, 1991, abandoned, which is a continuation of Ser. No. 306,129, Feb. 6, 1989, abandoned. This application Dec. 9, 1991, Ser. No. 805,271

Int. Cl.[5] C09K *11/59*

U.S. Cl. 252—301.6 F **3 Claims**

1. An alumina coated phosphor treatment process comprising the following steps:

step 1—fluidizing a manganese activated zinc silicate phosphor having an alumina protective coating and having a particle size of about 10–12 microns in an isothermal fluidized bed to form a fluidized phosphor powder, the alumina coating having been applied through chemical vapor deposition;

step 2—heating said fluidized phosphor powder to form an annealed phosphor powder, wherein said heating is carried out at a temperature from about 200° C. to about 850° C. and for a period of time sufficient to preclude adversely affecting said alumina protective coating of said phosphor during subsequent water-based suspension processing and to preclude detrimentally altering said phosphor;

step 3—cooling said annealed phosphor powder from step 2 to form a cooled annealed phosphor powder; and

step 4—adding said cooled annealed phosphor powder from step 3 to a water-base suspension.

5,151,216

HIGH TEMPERATURE ABLATIVE FOAM

Matthew T. Liu, Slidell, La., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Nov. 12, 1991, Ser. No. 790,763

Int. Cl.[5] B01J *13/00;* **C08G** *18/20, 18/24*

U.S. Cl. 252—307 **18 Claims**

1. An ablative foam composition, comprising:

approximately 150 to 250 parts by weight polymeric isocyanate having an isocyanate functionality of 2.6 to 3.2;

approximately 15 to 30 parts by weight reactive flame retardant having a hydroxyl number range from 200–260;

approximately 10 to 40 parts by weight non-reactive flame retardant;

approximately 10 to 40 parts by weight non-hydrolyzable silicone copolymer having a hydroxyl number range from 75–205;

approximately 3 to 16 parts by weight amine initiated polyether resin having an isocyanate functionality greater than or equal to 3.0 and a hydroxyl number range from 400–800.

5,151,217

MICRO-EMULSIONS

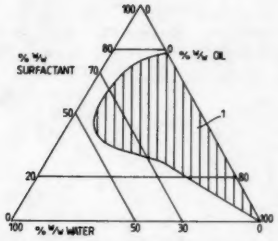
Anthony Price, Runcorn, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Mar. 22, 1991, Ser. No. 673,310

Claims priority, application United Kingdom, Mar. 26, 1990, 9006726

Int. Cl.[5] B01J *13/00*

U.S. Cl. 252—312 **11 Claims**



1. A bicontinuous microemulsion which comprises an aqueous phase, one or more addition-polymerisable water-immiscible organic materials and one or more addition-polymerisable surfactants.

5,151,218

PHOSPHORIC ACID ESTERS, METHOD OF PRODUCING THEM, AND USE THEREOF AS DISPERSANTS

Karl-Heinz Haubennestel, and Wolfgang Pritschins, both of Wesel, Fed. Rep. of Germany, assignors to BYK-Chemie GmbH, Wesel, Fed. Rep. of Germany

Division of Ser. No. 562,847, Aug. 6, 1990. This application Jan. 3, 1992, Ser. No. 816,717

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1989, 3930687

Int. Cl.[5] B01F *17/00;* **C08K** *5/00*

U.S. Cl. 252—351 **26 Claims**

1. A method of dispensing a powdered or fibrous solid in a liquid vehicle comprising incorporating said solid and a dispersion enhancing amount of a phosphoric acid ester corresponding to the formula (I)

(I)

wherein

R represents an aliphatic, cycloaliphatic and/or; aromatic moiety free of any Zerewitinoff hydrogen, containing at least one ether oxygen atom (—O—) and at least one carboxylic acid ester group (—COO—) or urethane group (—NHCOO—), and having an average molecular weight M_n of 200 to 10,000, wherein aliphatic hydrogen atoms may be partially replaced by halogen atoms, and wherein the ratio of the number of ether oxygen atoms to the number of carboxylic acid ester groups or urethane groups in each group R is in the range from 1:20,to 20:1, and

N represents 1 or 2, or a salt thereof in said liquid vehicle.

5,151,219

USE OF PARTICULAR MIXTURES OF ETHYL LACTATE AND METHYL ETHYL KETONE TO REMOVE UNDESIRABLE PERIPHERAL MATERIAL (E.G. EDGE BEADS) FROM PHOTORESIST-COATED SUBSTRATES

Thomas E. Salamy, North Kingstown, R.I.; Marvin L. Love, Jr., Mesa, and Mark E. Towner, Gilbert, both of Ariz., assignors to OCG Microelectronic Materials, Inc., Cheshire, Conn.

Division of Ser. No. 141,128, Jan. 6, 1988, Pat. No. 4,886,728. This application Jul. 31, 1989, Ser. No. 386,659

Int. Cl.[5] B01F *1/00*

U.S. Cl. 252—364 3 Claims

1. A solvent mixture consisting essentially of a mixture of ethyl lactate and methyl ethyl ketone present in a volume ratio of about 65:35 to about 25:75, respectively.

5,151,220

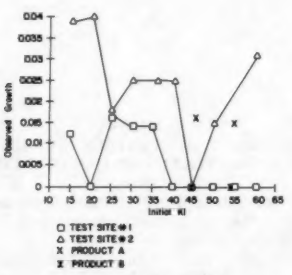
CHEMICAL ABATEMENT OF CARBONATE CRACKING

Veronica K. Majestic, Stafford, and Russell C. Strong, Richmond, both of Tex., assignors to Nalco Chemical Company, Naperville, Ill.

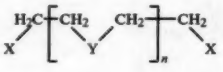
Filed Aug. 7, 1990, Ser. No. 563,452

Int. Cl.[5] C23F *11/12, 11/14*

U.S. Cl. 252—392 11 Claims



1. A method of inhibiting carbonate stress corrosion cracking of carbon steels exposed to refinery gaseous and/or liquid streams in a fluid catalytic cracking unit, which method comprises treating said fluid catalytic cracking unit refinery stream with an effective carbonate stress cracking inhibitory amount of the reaction product of a hydrocarbonaceous carboxylic acid having from about 8 to about 30 carbon atoms with a heterochemical having the structure:



wherein:

X is chosen from the group consisting of —NRH, —OH, and mixtures thereof;

Y is chosen from the group consisting of —NR—, —O—, and mixtures thereof;

R is chosen from the group consisting of H, CH_3, C_2H_5, C_3H_7, and mixtures thereof, and

n ranges from about 0 to about 6;

and further wherein the hydrocarbonaceous carboxylic acid is reacted with the heterochemical at a temperature ranging from 70° to 210° C. for at least one hour and in a mole ratio ranging from about 0.25:1.0 to about 7.5:1.0.

5,151,221

CONDUCTIVE PLASTIC COMPOSITES

Jan-Erik Österholm, Porvoo; Jukka Laakso, Helsinki; Sari Karjalainen, and Pirjo Mononen, both of Porvoo, all of Finland, assignors to Berggren Oy Ab, Helinski, Finland

Filed Feb. 28, 1989, Ser. No. 316,774

Claims priority, application Finland, Jul. 29, 1988, 873308

Int. Cl.[5] H01B *1/00;* C04B *35/00, 35/60*

U.S. Cl. 252—500 7 Claims

1. A process for the preparation of a conductive polymer composite wherein a matrix polymer is mixed with a poly (3-substituted thiophene) in the molten state to make a homogeneous composite, the poly (3-substituted thiophene) is doped with an electron acceptor, and thereafter a finished composite is formed.

5,151,222

FOAM ABSORBER

John M. Ruffoni, San Diego, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 26, 1991, Ser. No. 749,993

Int. Cl.[5] C08J *9/38, 9/40, 9/42*

U.S. Cl. 252—511 6 Claims

1. A process for producing a foam material having electromagnetic energy attenuation characteristics which comprises

providing a solution of a curable epoxy resin composition in a solvent,

adding carbon and a metal selected from the group consisting of silver, copper and nickel to said resin composition,

spraying the resulting mixture onto a surface of an open cell reticulated polyurethane foam substrate, causing said mixture to coat said surface of the foam substrate and to penetrate and filter through said foam substrate in gradually decreasing amount from said coated surface to a final depth in said foam to provide a dielectric gradient layer, and

curing said epoxy resin to form a carrier for said carbon and metal of said dielectric gradient, said cured epoxy carrier having substantially the same flexibility characteristics as said polyurethane foam.

5,151,223

LIQUID SOFTERGENT FORMULATIONS HAVING IMPROVED STABILITY AND SOFTENING PROPERTIES

Heidrun E. Maaser, Monmouth Junction, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 117,274, Nov. 5, 1987, abandoned. This application Mar. 7, 1990, Ser. No. 517,469

Int. Cl.[5] C11D *1/62;* D06M *13/46*

U.S. Cl. 252—547 13 Claims

1. A stable, liquid, softergent composition which simultaneously cleans, softens and controls the static of fabrics washed therewith in the wash cycle of the laundering process without reducing brightener and detergency performance comprising, by weight, about 10% to 30% of a nonionic surfactant; about 6% to 9% of a C6–C18 alkyl 2-ethyl hexyl dimethyl quaternary ammonium softening agent; 3.8% to 7% of a sulfated or sulfonated anionic surfactant, the molar ratio of said anionic surfactant to said cationic softener being about 1:1; and about 0.1% to 1% of an anionic optical brightener having a sulfonate moiety in its structure solubilized in an aqueous vehicle, said composition being stable and clear upon aging at 21° C. and 5° C.

5,151,224

TETRASULFONATED METAL PHTHALOCYANINE DOPED ELECTRICALLY CONDUCTING ELECTROCHROMIC POLY(DITHIOPHENE) POLYMERS

Marc J. Madou, Palo Alto; Subhash C. Narang, Redwood City; Takaaki Otagawa, Fremont, and Sharon Wing, Cupertino, all of Calif., assignors to Osaka Gas Company, Ltd., Osaka, Japan

Filed May 5, 1988, Ser. No. 190,540
Int. Cl.[5] G02B *5/23*; C08K *5/09*; C08G *75/00*
U.S. Cl. 252—586 6 Claims

1. A smooth electrically conductive electrochromic polymer consisting essentially of poly(dithiophene), which polymer is doped with an electrically conductive electrochromic tetrasulfonated metal phthalocyanine, wherein the polymer-dopant combination is produced by a process which comprises:

A. contacting a solution, itself comprising:

(a) dithiophene monomer present in between about 0.1 and 0.001M concentration;

(b) a water-soluble salt of a tetrasulfonated metal phthalocyanine wherein the metal is selected from the group consisting of iron, copper, cobalt and nickel, and the tetrasulfonated metal phthalocyanine is present at a concentration of between about 0.01 and 10 mM; and

(c) an electrolyte solution of acetonitrile and water in a ratio of between about 30:70 to 10:90 percent of acetonitrile to water by volume, with a cycling electrical potential of between about 0.01 volts and 10 volts and a variable current of between about 0.1 and 2 amperes,

at a temperature of between about 0° and 95° C. for between about 0.01 and 60 minutes, with a metal electrode wherein the metal electrode is selected from the group consisting of platinum, palladium, indium, gold, mixtures of these metals and indium-tin oxide (ITO) covered glass; and

B. recovering the smooth electrically conductive electrochromic polymer formed thereby, wherein the electrically conductive dopant is present in between about 0.01 and 5 percent by weight.

5,151,225

FLAME RETARDANT COMPOSITION AND METHOD FOR TREATING WOOD

James F. Herndon, Thomson, Ga., and Dennis J. Morgan, Springfield, Oreg., assignors to Hoover Treated Wood Products, Inc., Thomson, Ga.

Continuation-in-part of Ser. No. 345,969, May 1, 1989, abandoned. This application Sep. 26, 1990, Ser. No. 588,278
Int. Cl.[5] C09K *21/00*
U.S. Cl. 252—607 27 Claims

1. A substantially formaldehyde-free flame retardant composition for wood having reduced corrosive properties and having a pH of between 4.75 and 5.25 consisting essentially of from about 28% to about 38% by weight of an amide selected from the group consisting of urea, dicyanidiamide and combinations thereof; from about 22% to about 32% by weight of an oxy-acid of phosphorus; from about 10.5% to about 20.5% by weight of a metal salt of boron; from about 10.5% to about 20.5% by weight of an oxy-acid of boron; and sodium hydroxide.

5,151,226

PROCESS OF MAKING CONTOURED VEHICLE INTERNAL PANELLING SUPPORTS

Rainer Anton, Bardowick, and Dieter Harneit, Neetze, both of Fed. Rep. of Germany, assignors to Deutsche Fibrit Gesellschaft Abers & Dr Muller GmbH, Krefeld, Fed. Rep. of Germany

Continuation of Ser. No. 515,547, Apr. 26, 1990, abandoned, which is a continuation of Ser. No. 393,638, Aug. 14, 1989, abandoned. This application Dec. 11, 1990, Ser. No. 626,601
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1988, 3828655
Int. Cl.[5] B29C *35/12*
U.S. Cl. 264—25 3 Claims

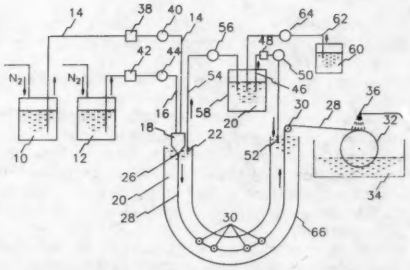
1. A process for the production of a wood fiber-based contoured vehicle internal panelling support having surfaces smooth on both sides, consisting essentially of depositing onto a contoured preforming screen an aqueous suspension of wood fiber containing at least one bonding agent, dewatering the resulting preform to a residual water content of 20 to 50%, drying the preform in an electric alternating field at a temperature below the starting reaction temperature of the bonding agent to a residual moisture content in the range of 10 to 30% by weight of the wood fibers, then compression molding in a screenless tool, and hardening.

5,151,227

PROCESS FOR CONTINUOUS SPINNING OF HOLLOW-FIBER MEMBRANES USING A SOLVENT MIXTURE AS A PRECIPITATION MEDIUM

Thanh D. Nguyen, Billerica, and Christopher M. Hubby, Newton, both of Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Mar. 18, 1991, Ser. No. 671,066
Int. Cl.[5] B29C *67/20*
U.S. Cl. 264—41 25 Claims



14. A process for forming a microporous polysulfone hollow fiber membrane, comprising:

(a) preparing, in a solvent for polysulfone, a casting solution comprising about 8.0 to about 35.0 wt.% of a polysulfone polymer, up to about 20.0 wt.% of a second polymeric component, and a pore-forming component,

(b) preparing an outer precipitation solution comprising a solvent for polysulfone, a non-solvent for polysulfone and a swelling agent,

(c) preparing a center precipitation solution comprising a solvent for polysulfone, a non-solvent for polysulfone and a swelling agent,

(d) providing a precipitation bath containing said outer precipitation solution and having a hollow fiber-forming spinnerette partially immersed therein,

(e) extruding said casting solution and said center precipitation solution through said spinnerette directly into said precipitation bath to form an extruded hollow fiber membrane,

(f) maintaining substantially constant concentrations of said

outer precipitation solution components by addition of non-solvent at a rate determined by the formula:

$$r_{NSA}=(r_{SL}\div C_{S\ in\ PPT})-r_{SL},$$

(g) drawing said extruded hollow fiber membrane through said precipitation bath, and

(h) drying said extruded hollow fiber membrane.

5,151,228

PROCESS FOR MANUFACTURING LARGE-SIZE POROUS SHAPED BODIES OF LOW DENSITY BY SWELLING

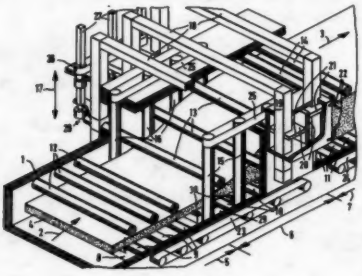
Wolfgang Vahlbrauk, Bad Gandersheim, Fed. Rep. of Germany, assignor to Loro-Holding K.H. Vahlbrauk KG, Bad Gandersheim, Fed. Rep. of Germany

Filed May 25, 1990, Ser. No. 529,234

Claims priority, application Fed. Rep. of Germany, May 27, 1989, 3917282

Int. Cl.[5] B29C *65/00*; C04B *40/00*

U.S. Cl. 264—42 **5 Claims**



1. A process of manufacturing large-size porous shaped bodies of low density by swelling clay masses by supplying heat thereto, comprising the steps of

introducing an unswollen plate-like, self-supporting clay mass in the form of a thin, compact clay slab

into a furnace and suddenly continuously rapidly swelling the slab by heat supplied exclusively from above and below at a maximum furnace temperature which remains constant from the beginning to the end of the swelling;

subjecting the surface of the swelling clay mass to constant oxidation by supply of oxidizing hot gases to the surface of the clay slab;

giving the swelling clay slab a support by direct-acting, multiple linear solid body contact, while maintaining the swelling clay slab in constant motion relative to the support, said support being effected by rollers being rotatably arranged below, above and on both sides of the swelling clay slab;

said introducing of said clay slab into said furnace being effected by driving said rollers;

guiding the clay slab during its movement through said furnace by said rollers in the downward and lateral directions in an unyieldable manner, while yieldably guiding the clay slab in the upward direction;

counting the yielding of the swelling clay slab upwards during increasing of its height by an adjustable structure-stabilizing counter-force against a swelling-force;

using said adjustable counter-force for variable geometrical expansion of the swelling mass for controlling the swelling process,

said controlling of the swelling process including creating an isostatic pressure controlled so that shaping occurs during the swelling by top rollers above the swelling clay mass to provide a fine distribution of pores,

said guiding of the clay slab including supporting the swelling mass on all other sides so that at a rear it is supported by an unswollen clay mass, which is held by means of frictional resistance by rollers and at the front it is supported by an already swollen clay mass which is held by means of frictional resistance by rollers.

5,151,229

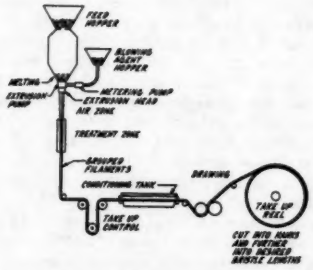
METHOD FOR PRODUCING PAINT BRUSH BRISTLES

Fredrick B. Burns, Milwaukee, Wis., assignor to EZ Paintr Corporation, Milwaukee, Wis.

Continuation of Ser. No. 199,095, May 26, 1988, abandoned, which is a division of Ser. No. 80,948, Aug. 3, 1987, Pat. No. 4,937,141, which is a division of Ser. No. 177,610, Apr. 5, 1988, abandoned. This application Oct. 15, 1990, Ser. No. 597,284

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—51 **8 Claims**



1. A method of producing a cellular paint brush bristle containing axially elongated cells and composed of synthetic thermoplastic material selected from the group consisting of nylon, polyester, polyolefin and mixtures thereof, said bristle having a rough and irregular surface and being in the form of a filament, said cells being predominantly closed in the interior of the bristle and being open along a wall or outer surface of said bristle to form said rough and irregular surface, the method comprising the steps of:

melting synthetic material selected from the group consisting of polyester, nylon, polyolefin and mixtures thereof, which are extruded into a bristle;

incorporating a blowing agent which is compatible with said synthetic material into said synthetic material in an amount sufficient to generate a multiplicity of cells within the synthetic material in a randomly dispersed manner, in which at least some of said cells extend through the outer surface of said filament and create randomly disposed and variously sized crater-like interruptions in said outer surface; and

drawing the synthetic material to a degree sufficient to form a drawn, extruded filament, and to cause the randomly disbursed cells to be elongated in the direction of the axis of the filament.

5,151,230

PROCESS FOR PRODUCTION OF PRODUCTS FORMED OF POLYMER BONDED AND GRANULATED PARTICLES

Dirk H. Damberg, Tappen, Canada, assignor to Dinoflex Manufacturing Ltd., Salmon Arm, Canada

Filed Oct. 1, 1990, Ser. No. 591,476

Int. Cl.[5] B27N *3/00*; C08J *5/00*; D21B *1/04*

U.S. Cl. 264—83 **10 Claims**

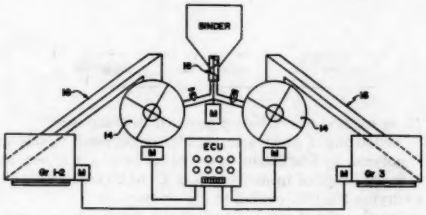
1. A process of forming a compressed cured material from a mixture comprising:

(a) about 75 to 95.5 weight % of elastic or inelastic particles of a substance selected from the group consisting of granulated rubber, polymerized ethylenepropylenediene, neoprene, granulated cork, granulated polyvinylchloride and

granulated sawdust, wherein the particles are of a size range of about 0.1 to 8.0 mm;

(b) about 2.5 to 25.0 weight % of a polymer binder selected from the group consisting of a one or two component polyurethane system and a one or two component polyacrylate resin system;

(c) about 0 to 20.0 weight % of a colouring pigment selected from the group consisting of iron oxide and chrome oxide; and



(d) about 0.1 to 0.5 weight % of water as a catalyst, the proportions of (a), (b), (c) and (d) adding up to 100% weight, which process comprises placing the mixture in a mold and applying heat in a form of steam at a temperature between 110° C. and 140° C. and at a pressure between about 3 to 8 bars and at a rate between 40 to 90 kg per hour to the mixture, and applying pressure of between about 25 to 160 bars to the mixture to compress the mixture and effect a cure of the mixture and thus form the compressed cured material.

5,151,231

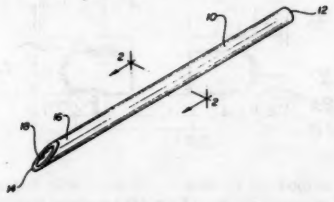
METHOD FOR MAKING LIQUID CRYSTALLINE TUBE HAVING A POINT

James M. Lambert, Centerville, and Donald D. Solomon, Spring Valley, both of Ohio, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 495,072, Mar. 19, 1990, Pat. No. 5,078,700. This application Sep. 26, 1991, Ser. No. 765,782

Int. Cl.[5] B29C *47/20*

U.S. Cl. 264—108 **6 Claims**



1. A method for preparing a liquid crystalline polymeric tubing having a point comprising:

a) heating a thermotropic liquid crystalline polymer to give a melt having a viscosity of 500 poise or less;

b) directing said melt into a tubing mold which includes a point whereby said melt completely fills said mold;

c) cooling said melt in said mold whereby said melt solidifies to a tubing having the shape of said mold; and

d) removing said tubing from said mold.

5,151,232

INJECTION MOULDING PROCESS

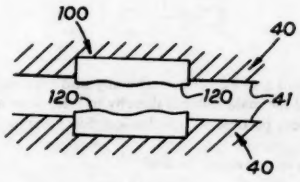
John B. Thornthwaite, and Robert Naismith, both of Nottingham, England, assignors to Games Workshop Limited, Nottinghamshire, England

Division of Ser. No. 551,647, Jul. 12, 1990, Pat. No. 5,013,228, which is a continuation of Ser. No. 248,068, Sep. 23, 1988, abandoned. This application Feb. 8, 1991, Ser. No. 652,674

Claims priority, application United Kingdom, Sep. 26, 1987, 8722668

Int. Cl.[5] B28B *7/20;* **B29C** *33/40, 43/00, 67/00*

U.S. Cl. 264—130 **5 Claims**



1. A process for producing injection moulded plastic mouldings, the process including the steps of:

a) producing separable mating resilient mould inserts which abut along opposed abutment faces to define therebetween a mould cavity;

b) inserting said resilient mould inserts into opposed movable mould parts of a plastic injection moulding apparatus such that upon movement of said movable mould parts, said resilient mould inserts abut to form said mould cavity prior to said movable mould parts abutting one another;

c) moving said movable mould parts into abutment such that said mould inserts abut each other to define said mould cavity and then said movable mould parts abut one another;

d) injecting molten plastic into said cavity to create a plastic moulding; and

e) moving said mould parts apart to separate said mould inserts to permit removal of said plastic moulding,

f) said separable mating mould inserts being produced by:

i) placing an article of which subsequent plastic mouldings are to be produced between opposed bodies of a mouldable material which is curable to form a resilient material;

ii) pressing said opposed bodies of mouldable material together so as to press said article into both bodies of mouldable material so as to create an impression of said article in said mouldable material;

iii) curing said mouldable material so as to retain said impression and form separable bodies of resilient material;

iv) separating said bodies of resilient material and removing said article to thereby create said mould cavity between said formed separable bodies of resilient material when said separable bodies are mated as said mould inserts.

5,151,233

APPARATUS AND METHOD FOR FORMING A PARTIBLE PORT IN A PRODUCTION PIECE

Michael L. Wendt, 1382 E. Hull Rd., Hope, Mich. 48628

Filed Nov. 30, 1990, Ser. No. 621,226

Int. Cl.[5] B29C *43/02*

U.S. Cl. 264—153 **38 Claims**

1. A method of thermoforming a sheet of material having a first thickness into a production piece having a breakaway port section

including the steps of:

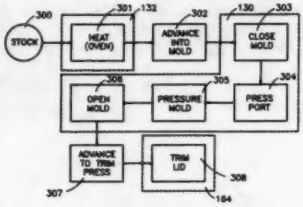
heating said material into a plastic state;

positioning said material between a punch element on one

side thereof and a strike surface on another side thereof wherein said punch element has male features configured in the shape of the breakaway port section;

squeezing a portion of said material between a punch element and a strike surface whereby said material is forged around the male features thereby to form lines of reduced thickness partible by mechanical force exerted thereon; and

allowing said material to cool.



5,151,234

METHOD FOR THE MANUFACTURE OF THERMOPLASTIC RESIN SHEETS

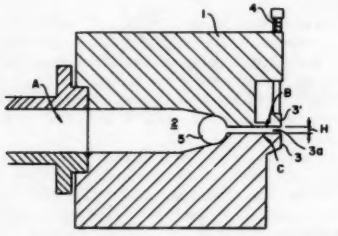
Makoto Ishihara, Ohtsu; Kazuhiro Kiminami, Kusatsu; Masakazu Wakabayashi; Hirokazu Hori, both of Shiga; Saneharu Tatsu, and Sachio Takeshita, both of Shiga, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 29, 1990, Ser. No. 500,988

Claims priority, application Japan, Mar. 31, 1989, 1-83315; Mar. 31, 1989, 1-83316

Int. Cl.[5] B29C *47/92*

U.S. Cl. 264—176.1 **4 Claims**



1. A method for the manufacture of polyvinyl butyral sheets comprising extruding molten polyvinyl butyral at an extrusion velocity V through a slot provided in an extrusion mold so as to form polyvinyl butyral sheets with embossed surfaces,

wherein said polyvinyl butyral is extruded from said slit in said extrusion mold under conditions such that the ratio V/H of said extrusion velocity V to the width H of said slit exceeds a critical value (V/H)c, said critical value (V/H)c being the ratio of the extrusion velocity to the width of the mold slit at which the roughness of said embossment begins to increase after initially decreasing when said polyvinyl butyral sheet is fabricated under conditions where said ratio V/H is progressively increased.

5,151,235

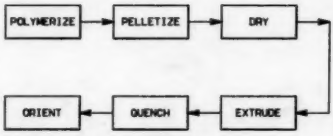
PROCESS OF MAKING PHENYLENE SULFIDE/BIPHENYLENE SULFIDE COPOLYMER PIPE

Jerry O. Reed, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 23, 1990, Ser. No. 556,685

Int. Cl.[5] B29C *55/22, 55/26*

U.S. Cl. 264—209.5 **19 Claims**



11. A method of producing pipe which comprises:

a) pelletizing a phenylene sulfide/biphenylene sulfide copolymer by first extrusion means operated at temperatures in the range of from about 300° C. to about 320° C.;

b) drying the thus pelletized copolymer;

c) forming the thus dried, pelletized copolymer into essentially amorphous pipe by second extrusion means operated at temperatures in the range of from about 300° C. to about 310° C. followed by rapid and uniform quench to avoid pipe crystallization; and

d) orienting the thus formed essentially amorphous pipe by subsequent die extrusion by third extrusion means operated at temperatures in the range of from about 85° C. to about 110° C., wherein the subsequent extrusion is performed with a pipe pulloff rate in the range of from about 0.5 cm/minute to about 50 cm/minute with a longitudinal draw ratio in the range of about 2× to about 7× and a transverse draw ratio in the range of about 2× to about 3×.

5,151,236

METHOD FOR FORMING CONVEX NON-EXTRACTABLE FORMED PIECES MADE OF A COMPOSITE MATERIAL

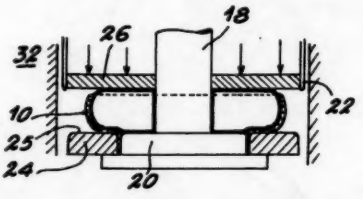
Sauveur A. Azzara, Sartrouville, and Hervé G. F. Coutant, Le Chesnay, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Nov. 30, 1990, Ser. No. 621,241

Claims priority, application France, Dec. 5, 1989, 89 16058

Int. Cl.[5] B29C *43/18*

U.S. Cl. 264—257 **9 Claims**



1. A method for forming a non-extractable formed piece made of composite material from a flat preform strip including fibers preimpregnated with resin and orientated along at least two different non-longitudinal directions, the method comprising the steps of:

placing the preform strip in a forming tool along a cylindrical surface having one rectilinear generator and one convex directrix curve which has the shape of the piece to be formed, said tool including a forming die having a formed surface which has a section complementary to the piece to be formed;

applying a central portion of the preform strip against the formed surface of the forming die, by means of an inflatable bladder placed on the side of the preform strip with respect to the formed surface opposite said central portion;

forming an outer portion of the piece by moving a mobile hoop of the forming tool substantially parallel to said rectilinear generator, whereby said outer portion slides along said mobile hoop and is returned against the formed surface; and

solidifying the resin.

5,151,237

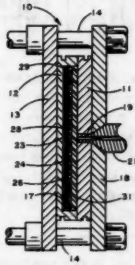
METHOD OF INJECTION MOLDING A FLAT DEFORMABLE LAMINATE

Siebolt Hettinga, 2123 NW. 111th St., Des Moines, Iowa 50322

Filed Jun. 11, 1990, Ser. No. 535,609

Int. Cl.[5] B29C *45/14, 45.16*

U.S. Cl. 264—257 **5 Claims**



1. A process of injection molding for forming a flat deformable laminate having a thermoplastic substrate, as the bonding agent, said process comprising:

(a) providing a thermoplastic resin and a deformable material wherein the memory recovery of the deformable material is less than the memory recovery of the thermoplastic resin;

(b) providing a soft porous material;

(c) lining a flat surface area of an injection mold cavity with said soft material;

(d) placing the deformable material against said soft material;

(e) closing said mold cavity with a second flat surface spaced from said deformable material to form a plastic receiving chamber means;

(f) injecting the thermoplastic resin within said chamber means and about said deformable material and into said soft material;

(g) allowing said thermoplastic resin to at least partially cool and harden; and then

(h) removing the resultant flat deformable laminate from the cavity, said flat deformable laminate capable of further deformation into a preselected shape after removal from said cavity.

5,151,238

PROCESS FOR PRODUCING COMPOSITE MATERIALS

Harold A. Earl, Colwyn Bay, and William B. Banks, Port Dinorwic, both of Wales, assignors to National Research Development Corporation, London, England

Filed Jun. 5, 1989, Ser. No. 361,044

Claims priority, application United Kingdom, Jun. 7, 1988, 8813396

Int. Cl.[5] B29C *67/20*

U.S. Cl. 264—136 **11 Claims**

1. A process for the production of a composite material, which process comprises the steps of:

immersing a cellulosic substrate in a solution of a di-functional isocyanate in an aprotic swelling solvent to cause said cellulosic substrate to swell, said cellulosic substrate reacting with said isocyanate; and

then compressing the substrate to form a composite material.

5,151,239

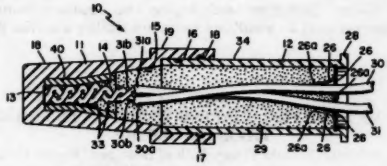
METHOD OF MAKING A WIRE JUNCTION ENCAPSULATING WIRE CONNECTOR

Lloyd H. King, Jr., Town & Country, Mo., assignor to King Technology of Missouri Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 574,808, Aug. 30, 1990, Pat. No. 5,113,037, which is a continuation-in-part of Ser. No. 478,687, Feb. 12, 1990, Pat. No. 5,023,402, which is a continuation-in-part of Ser. No. 450,156, Dec. 13, 1989, abandoned. This application Mar. 22, 1991, Ser. No. 673,792

Int. Cl.[5] H02G *15/08*

U.S. Cl. 264—272.11 **13 Claims**



1. A method of making a sealant containing shell around a ready to use twist on wire connector comprising the steps of:

placing a ready to use twist on wire connector having an interior region and an exterior region in a mold to thereby form a mold cavity around the exterior region of the twist on wire connector, the interior region of the twist on wire connector having a wire engaging surface for gripping and holding an electrical lead;

injecting a moldable electrical insulating material into the mold cavity and allowing the moldable material to solidify and to thereby form an electrical insulating shell around the exterior region of the twist on wire connector and a chamber for a sealant; and

injecting a sealant into the interior region of the twist on wire connector to thereby form a shell having both a twist on wire connector and a chamber for a sealant located therein end subsequently forming a sealant covering low resistance electrical connection around an electrical lead in the presence of the sealant by inserting electrical leads into the shell and the twist on wire connector, and including the step of grasping and holding the electrical leads in one hand while rotating the shell with the other hand to thereby lock and seal the electrical lead in the twist on wire connector.

5,151,240

LEATHER-LIKE MATERIAL HAVING EXCELLENT WATER VAPOR PERMEABILITY AND SUPPLENESS AND ITS MANUFACTURE

Koin Asano, Takatsuki; Kenichi Tagawa, Hofu; Hiroshi Nakagawa, Hofu, and Hiroyuki Wakahara, Hofu, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Sep. 21, 1989, Ser. No. 410,701

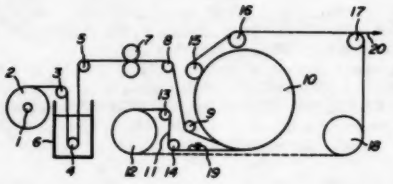
Claims priority, application Japan, Sep. 6, 1989, 1-229372

Int. Cl.[5] B29C *41/00*

U.S. Cl. 264—284 **6 Claims**

5. A process for manufacturing an imitation leather material product comprising the steps of: applying a coating of a water-miscible solvent solution onto a release belt, said solvent solution containing a polyurethane elastomer; superimposing a water-moisturized substrate onto said coating, said water-moisturized substrate having a water add-on amount of 30–150% based on the weight of the substrate; applying heat to an upper surface of said water-moisturized substrate by means disposed above it to cause the formation of water vapor therein; coagu-

lating said polyurethane elastomer by said water vapor to cause said polyurethane elastomer to bond to said substrate and form a resultant imitation leather material; removing said resultant imitation leather material from said release belt; washing



said resultant imitation leather material to remove any remaining solvent therefrom; and drying said resultant imitation leather material to yield said imitation leather material product.

5,151,241

METHOD FOR SHAPING WORKPIECES FROM THERMOPLASTICS

Dieter Maier; Harald Egner, both of Stuttgart; Stefan Frohlich, Mutlangen, and Jurgen Hoffmann, Denkendorf, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung e.v., Munich, Fed. Rep. of Germany

Filed May 22, 1991, Ser. No. 703,922

Claims priority, application Fed. Rep. of Germany, May 23, 1990, 4016558; Mar. 22, 1991, 4109370

Int. Cl.[5] B29C *43/02*

U.S. Cl. 264—314 **4 Claims**

1. A method for shaping a tubular workpiece from thermoplastic plastics in a mold under the action heat, comprising:

applying an amount of heat required for shaping the workpiece to the workpiece to be shaped from the interior,

heating the workpiece to the softening temperature of the plastic,

maintaining the softening temperature until the workpiece assumes the shape determined by the mold, and leaving the workpiece in the mold until the workpiece has cooled off.

5,151,242

METHOD FOR VULCANIZING ELASTOMER PRODUCTS AND APPARATUS THEREFOR

Koji Soeda, Kobe; Yoshiya Kubota; Shoji Okamoto, both of Toyota; Akinori Kubota, Kobe; Michihito Kobayashi, Toyota; Masaaki Ijiri, Aichi; Nobuhiko Irie, Nagasaki; Akira Hasegawa, Nagasaki; Hideaki Katayama, Nagasaki; Toshifumi Murakami, Nagasaki, and Katsuyoshi Sakaguchi, Nagasaki, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

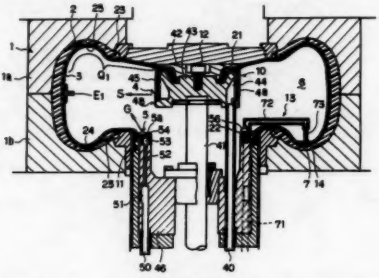
Filed Dec. 5, 1989, Ser. No. 446,260

Claims priority, application Japan, Dec. 8, 1988, 63-311332; Dec. 8, 1988, 63-311333

Int. Cl.[5] B29C *35/04;* B29D *30/00*

U.S. Cl. 264—572 **22 Claims**

1. A method for vulcanizing an elastomer product including a heating step, wherein said elastomer product is placed in a vulcanizing chamber formed in a mold, a heating steam at an elevated pressure is supplied to said vulcanizing chamber to heat and pressurize said elastomer product until said elastomer product reaches a prespecified temperature or for a prespecified period of time, said steam supply is stopped and inert gas, as a pressurizing gas at a pressure not lower than said steam supply pressure, is supplied to said vulcanizing chamber until the end of the heating step, and a discharging step subsequent



to said heating step, wherein said steam and said pressurizing gas are discharged to complete the vulcanizing, wherein said steam is blown in and supplied from an upper position of the center of said vulcanizing chamber into said vulcanizing chamber in a substantially horizontal direction, while said pressurizing gas is blown in and supplied from a lower position of the center of said vulcanizing chamber toward an upper region of said vulcanizing chamber.

5,151,243

METALLURGICAL VESSEL

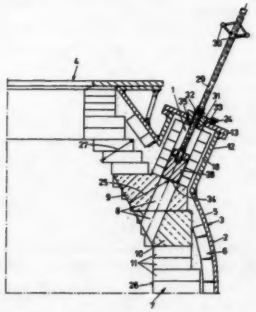
Johann Auer, St. Florian; Wilfried Pirklbauer, Niederneukirchen; Norbert Ramaseder, and Hellmuth Smejkal, both of Linz, all of Austria, assignors to Voest-Alpine Industrieanlagenbau G.m.b.H, Linz, Austria

Division of Ser. No. 595,587, Oct. 11, 1990, Pat. No. 5,096,165. This application Nov. 22, 1991, Ser. No. 795,996

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1989, 3934340

Int. Cl.[5] C21C *5/46*

U.S. Cl. 266—78 **16 Claims**



1. In a metallurgical vessel comprised of an outer shell lined on its interior wall with a refractory brick lining and adapted for melting metal,

said vessel having a probe opening therein of a length extending from the outer shell to the interior of said vessel for introducing a measuring and/or sampling probe therein,

said probe opening entering said vessel through said brick

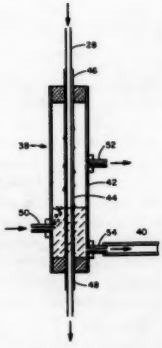
lining along its longitudinal axis, the combination therewith of a probe opening stopper entering said probe opening and made of a material selected from the group consisting of graphite and a graphite/alumina mixture consisting essentially by weight of about 60% to 85% graphite, with the balance essentially alumina and fireclay.

5,151,244

APPARATUS FOR FILTERING AND ADJUSTING THE PH OF NUCLEAR REACTOR COOLANT WATER FOR THE TESTING OF SOLUBLE CONTENTS THEREFOR

Robert J. Law; Michel N. Robles, both of Livermore, and Dane T. Snyder, San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Sep. 11, 1991, Ser. No. 757,773
Int. Cl.[5] G21C *17/02*
U.S. Cl. 376—245 **15 Claims**



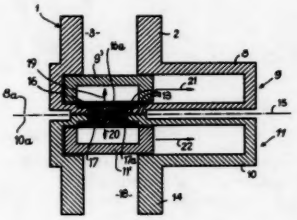
1. An apparatus for filtering and adjusting the pH of aqueous sample streams comprising the combination of a water cooled, heat producing nuclear reactor and an analytical testing device for evaluating soluble contents in the reactor coolant water, said nuclear reactor comprising a reactor vessel with a coolant water circulating system having at least one sampling water specimen conduit providing fluid communication between the reactor vessel coolant water circulating system and the analytical testing device for supplying test specimens of reactor coolant water to the testing device, a composite self-cleaning filtration and pH adjusting means for treating the sampled water specimens operatively located in the sampling water specimen conduit upstream from the analytical testing device, said filtration and pH adjusting device comprising an elongated housing having a hollow filter medium passing therethrough with an upstream external inlet into the hollow filter medium connected with the sampling water specimen conduit for feeding a flow of a sampled water specimen and a downstream external outlet from the hollow filter medium for discharging any excess of a water specimen, a downstream entry into the filter housing for supplying an acidifying gas into the filter housing external to the hollow filter medium for acidifying sampled water specimens introduced into the housing, a discharge outlet for the outflow of acidified and filtered sampled water specimen connected to the analytical testing device, and a discharge exit for disposing of excess acidifying gas and water specimen.

5,151,245

DEVICE FOR THE SEALED OPENING AND CLOSING OF A PASSAGE INTERCONNECTING A CENTRAL CHANNEL OF A TRANSPORTABLE HOLLOW BODY AND A VERTICAL WELL FORMED IN A FIXED STRUCTURE

Nicolas de Seroux, and Dominique Limouzin, both of Lyons, France, assignors to Framatome, France

Filed Jun. 26, 1991, Ser. No. 721,416
Claims priority, application France, Jun. 27, 1990, 90 08116
Int. Cl.[5] G21C *19/00*
U.S. Cl. 376—271 **6 Claims**



1. Device for sealed opening and closing of a passage interconnecting a central channel (3) of a transportable container (1) and a vertical well (18) in a fixed structure (14) comprising a bearing surface (10*a*, 15) via which an upper part of said vertical well (18) opens out and on which rests, with the interposition of at least one O-ring seal (13), a corresponding bearing surface (8*a*) of said container (1) via which said central channel (3) opens out, in a connected position in which one end of said central channel (3) of said container (1) is located in an axial extension of said well (18) in order to form a connecting passage, said device comprising, in positions adjacent to a corresponding bearing surface (8*a*, 10*a*, 15), a first member (16) for plugging said central channel (3) of the container (1) and a second member (17) for plugging said upper end of said well (18), said first and second members being arranged in a contact zone of said at least one O-ring seal (13) with said bearing surface (8*a*, 10*a*, 15), wherein said first plugging member comprises a first plannar surface (16*a*, 17*a*) arranged, when in closing position, in said planar bearing surface (10*a*) of said fixed structure (14, 10), respectively, such that a space between said first and second plannar surfaces is reduced to a negligible value, at least one of said first and second plugging members (16, 17) being adapted to move in an axial direction of said well (18) and of said central channel (3) of said container (1) and in a transverse direction perpendicular to said axial direction, between said closing position and said opening position.

5,151,246

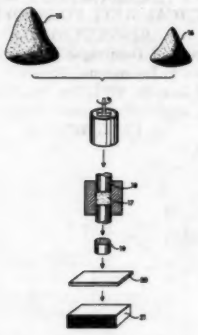
METHODS FOR MANUFACTURING FOAMABLE METAL BODIES

Joachim Baumeister, Bremen, and Hartmut Schrader, Schwanewede, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed May 31, 1991, Ser. No. 708,350
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1990, 4018360; Jan. 21, 1991, 4101630
Int. Cl.[5] B22F *1/00*
U.S. Cl. 419—2 **22 Claims**

1. A method for producing foamable metal bodies in which a mixture composed of at least one metal powder and at least one gas-splitting propellant powder is produced and hot-compacted to a semifinished product, comprising hot-compacting the mixture at a temperature at which the joining of the metal powder particles takes place primarily through diffusion and at

a pressure which is sufficiently high to hinder the decomposition of the propellant in such fashion that the metal particles



are permanently bonded to one another and form a gas-tight seal for the gas particles of the propellant.

5,151,247

HIGH PRESSURE ISOSTATIC DENSIFICATION PROCESS

Bengt O. Haglund, Älvsjö , and Bengt N. During, Upplands Väsby, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Filed Nov. 1, 1991, Ser. No. 786,608
Claims priority, application Sweden, Nov. 5, 1990, 9003521
Int. Cl.[5] G22F *5/00*
U.S. Cl. 419—13 **9 Claims**

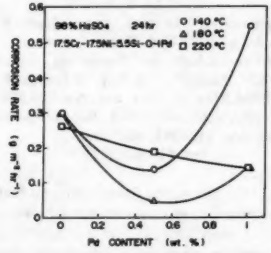
1. A method of liquid phase sintering of powder metallurgical parts in a high pressure furnace comprising applying a pressure to the part of from about 0.1–100 MPa at a temperature below the formation of eutectic liquid phase, T_{liq}, and maintaining this pressure during the remainder of the sintering cycle until the part has been subjected to substantial cooling.

5,151,248

PD-ADDED AUSTENITIC STAINLESS STEEL FOR USE FOR HIGH TEMPERATURE CONCENTRATED SULFURIC ACID

Ryuichiro Ebara; Hideo Nakamoto; Naohiko Ukawa; Tamotsu Yamada, all of Hiroshima, and Yasuo Nishimura, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 700,437, May 15, 1991, abandoned. This application Dec. 13, 1991, Ser. No. 807,633
Claims priority, application Japan, May 23, 1990, 2-131258
Int. Cl.[5] C22C *38/40*
U.S. Cl. 420—35 **2 Claims**



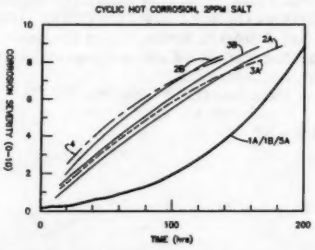
1. An austenitic stainless steel for use for high temperature concentrated sulfuric acid, comprising, on weight basis, 0.04% or less of C, 5–7% of Si, 2% or less of Mn, 15–25% of Cr, 4–24% of Ni, 0.01–1.07% of Pd and the rest consisting of Fe and unavoidable contaminant materials.

5,151,249

NICKEL-BASED SINGLE CRYSTAL SUPERALLOY AND METHOD OF MAKING

Curtiss M. Austin, Loveland; Ramgopal Darolia, Cincinnati, both of Ohio; Kevin S. O'Hara, Boxford, Mass., and Earl W. Ross, Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 29, 1989, Ser. No. 459,400
Int. Cl.[5] C22C *19/03*
U.S. Cl. 420—445 **35 Claims**



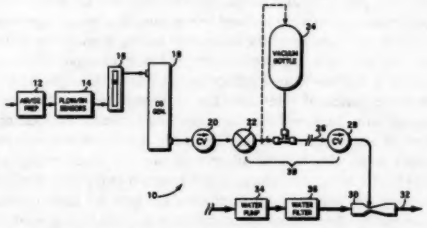
1. A nickel-based superalloy consisting essentially of, in weight percent, from about 4 to about 5 percent chromium, from about 12 to about 13 percent cobalt, from about 4 to about 8 percent tungsten, from about 6 to about 8 percent tantalum, from about 5 to about 7 percent aluminum, from about 5.7 to about 7 percent rhenium, from about 0.12 to about 0.18 percent hafnium, from about 0.4 to about 0.06 percent carbon, from 0 to about 0.0075 percent boron, from about 0.002 to about 0.030 percent yttrium, from 0 to about 6 percent ruthenium, from 0 to about 1 percent molybdenum, from 0 to about 1 percent niobium, and the balance essentially nickel, the superalloy further characterized by improved environmental resistance and stress rupture resistance.

5,151,250

AUTOMATIC PURGE METHOD FOR OZONE GENERATORS

Richard H. Conrad, P.O. Box 1300, Pt. Reyes Station, Calif. 94956

Filed Mar. 21, 1990, Ser. No. 497,126
Int. Cl.[5] C02F *1/78;* F15C *1/06;* F15D *1/02*
U.S. Cl. 422—2 **19 Claims**



1. An apparatus for regulating flow in an ozone generation system, and for automatically purging residual ozone upon shutdown of said ozone generation system, said apparatus comprising:

an ozone generator;

a negative pressure ozone injector device connected by a fluid flow line to said ozone generator;

a first check valve member interposed in said fluid flow line between said ozone generator and said negative pressure ozone injector device;

a vacuum reservoir interposed in said fluid flow line between said first check valve member and said negative pressure ozone injector device;

a second check valve member interposed in said fluid flow line between said vacuum reservoir and said negative pressure ozone injector device; and

a restrictive orifice member interposed in said fluid flow line between said ozone generator and said vacuum reservoir;

wherein while said negative pressure ozone injector device is in operation, a pressure differential exists across said restrictive orifice, with a lower pressure in said vacuum reservoir and a higher pressure in said ozone generator; and upon shutdown of said ozone generator and said negative pressure ozone injector device, said lower pressure causes said second check valve to close, and said pressure differential causes said residual ozone to be drawn from said ozone generator into said vacuum reservoir until said pressure differential becomes nearly equalized, whereupon said first check valve automatically closes.

5,151,251

GAS PURIFIER HAVING END OF LIFE DETECTOR

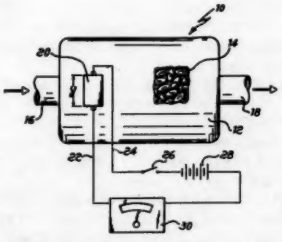
Carolina Solcia, and Marco Succi, both of Milan, Italy, assignors to SAES Getters SpA, Milan, Italy

Filed May 20, 1991, Ser. No. 702,305

Claims priority, application Italy, Jun. 26, 1990, 20768 A/90

Int. Cl.[5] G01L *9/00*; G05D *15/00*; B01D *46/00*

U.S. Cl. 422—119 **7 Claims**



1. A gas purifier for impure gas having an end of life detector, said purifier comprising:

A. a housing; and

B. an impurity-sorbing material packed within the housing wherein said impurity-sorbing material has the property of reacting with impurities in the impure gas wherein the reaction causes expansion of the impurity-sorbing material, thereby causing the housing to expand; and

C. an impure gas inlet in fluid communication with the housing; and

D. a purified gas outlet in fluid communication with the housing; and

E. a strain gauge carried by the housing; and

F. means for determining the strain of the strain gauge thereby determining the end of life of the impurity-sorbing material.

5,151,252

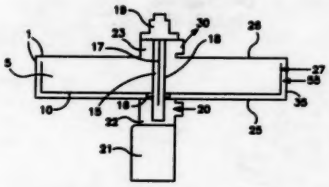
CHAMBER DESIGN AND LAMP CONFIGURATION FOR AN ULTRAVIOLET PHOTOCHEMICAL REACTOR

Barton Mass, San Jose, Calif., assignor to Purus, Inc., San Jose, Calif.

Filed Oct. 17, 1991, Ser. No. 778,651

Int. Cl.[5] B01J *19/12*

U.S. Cl. 422—186.3 **25 Claims**



1. A reactor for treatment of a fluid with a line-type light source which comprises:

a reactor housing forming an internal space comprising at least one fluid entry region, at least one fluid exit region,

a central photochemical treatment region comprising a housing and a means for circumferentially distributing fluid radially toward and perpendicular to a line-type light source, wherein the central photochemical treatment region is rotationally symmetrical about a central axis, and

at least one line-type light source located in said treatment region substantially on the central axis of said treatment chamber region, the arc of said light source being oriented parallel to said central axis.

5,151,253

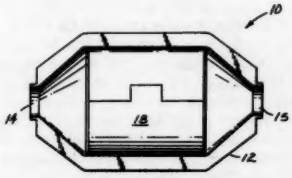
CATALYTIC CONVERTER HAVING A MONOLITH MOUNTING OF WHICH IS COMPRISED OF PARTIALLY DEHYDRATED VERMICULITE FLAKES

Richard P. Merry, White Bear Lake, Minn., and Roger I. Langer, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 18, 1991, Ser. No. 687,296

Int. Cl.[5] B01D *53/36*

U.S. Cl. 422—179 **12 Claims**



1. A catalytic converter comprising a casing and a monolithic catalytic element which is mounted in the casing by a layer comprising intumescent vermiculite flakes that have

a) from about 1.0 to 3.2% by weight of chemically bound water, and

b) a uniform bulk density from about 0.2 to 0.9 g/cm^3.

5,151,254

EXHAUST GAS CLEANING DEVICE FOR INTERNAL COMBUSTION ENGINE

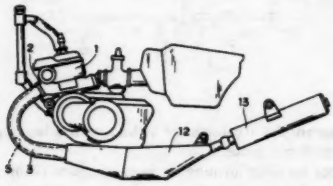
Hideki Arai; Makoto Kawai, and Kenji Miyai, all of Shizuoka, Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 28, 1990, Ser. No. 573,753

Claims priority, application Japan, Aug. 29, 1989, 1-220264; Aug. 29, 1989, 1-220265; Aug. 29, 1989, 1-220266; Aug. 29, 1989, 1-220267; Aug. 29, 1989, 1-220268

Int. Cl.[5] F01N *3/10*

U.S. Cl. 422—180 **17 Claims**



1. An exhaust gas system for an internal combustion engine, comprising:

an exhaust pipe open at one end thereof and connected at said one end thereof to an exhaust port of said internal combustion engine for receiving exhaust gases discharged from said internal combustion engine, and open at an opposite end thereof for discharging said exhaust gases away from said internal combustion engine;

an inner pipe disposed coaxially within said exhaust pipe with an annular space defined between an outer surface of said inner pipe and an inner surface of said exhaust pipe, said inner pipe being open at a first end thereof and connected at said first end thereof to said exhaust port of said internal combustion engine for receiving said exhaust gases discharged from said internal combustion engine, and being open at a second end thereof for discharging said exhaust gases away from said internal combustion engine, said inner pipe also being provided with a plurality of perforations within sidewall portions thereof for providing fluidic communication between said inner pipe and said annular space defined between said inner pipe and said exhaust pipe; and

layer structures disposed upon inner and outer surfaces of said inner pipe and including a catalyst for cleaning unburned components of said exhaust gases flowing axially within said exhaust pipe and said inner pipe between said one and opposite ends of said exhaust pipe and between said first and second ends of said inner pipe, each of said layer structures being formed of a material which is non-deleterious to said catalyst.

5,151,255

METHOD FOR FORMING WINDOW MATERIAL FOR SOLAR CELLS AND METHOD FOR PRODUCING AMORPHOUS SILICON SOLAR CELL

Nobuhiro Fukuda; Sadao Kobayashi; Kenji Miyachi; Hidemi Takenouchi, all of Yokohama; Yoji Kawahara, Hiroshima, and Takayuki Teramoto, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

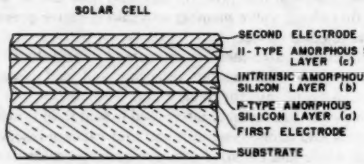
Continuation of Ser. No. 439,433, Nov. 21, 1989, abandoned, which is a continuation of Ser. No. 114,595, Oct. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 766,968, Aug. 19, 1985, abandoned. This application Oct. 3, 1990, Ser. No. 593,480

Claims priority, application Japan, Aug. 20, 1984, 59-171436

Int. Cl.[5] B01J *19/08, 19/12*

U.S. Cl. 422—186.05 **6 Claims**

1. A window material for solar cell consisting of a dehydrogenated silicon (SiH_2)-based p-type amorphous silicon semiconductor film having an optical band gap of at least 1.8 eV and containing 29 to 39 atomic percent of hydrogen with 25 to 36 atomic percent thereof being in the form of dihydride (SiH_2) and 3 to 6 atomic percent thereof being in the form of monohydride (SiH), said window material being formed by decompos-



ing on a substrate a gaseous mixture composed of disilane, a substance capable of imparting p-type electrical conductivity and a diluent gas by applying a flow discharge energy in the range of 0.5 to 8.5 KJ/g-disilane.

5,151,256

COAL COMBUSTION APPARATUS PROVIDED WITH A DENITRATION

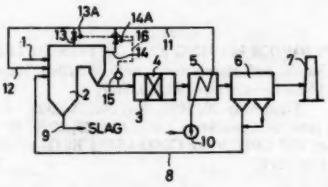
Yasuyoshi Kato; Kunihiko Konishi; Nobue Teshima; Toshiaki Matsuda, and Hiroshi Akama, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 296,209, Jan. 12, 1989, abandoned. This application May 2, 1991, Ser. No. 673,256

Claims priority, application Japan, Jan. 19, 1988, 63-9169

Int. Cl.[5] B01D *47/00;* B01J *8/00;* C01B *21/00*

U.S. Cl. 423—210 **6 Claims**



1. A method for eliminating volatile metal compounds present in an exhaust gas of a coal combustion apparatus provided with a denitration means for catalytic reduction with ammonia, comprising the steps of:

blowing an air into the exhaust gas prior to feeding the exhaust gas to the denitration means, the air having a temperature of at least 500° C., and blown into the exhaust gas until said exhaust gas contains at least about 2% by volume of oxygen to oxidize said volatile metal compounds; and

causing said oxidized metal compounds to adsorb onto fly ash present in the exhaust gas during the process of the exhaust gas moving downstream to the denitration means.

5,151,257

REMOVAL OF HYDROGEN SULFIDE FROM FLUID STREAMS

Dennis R. Kidd, Dewey, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 499,847, Mar. 27, 1990, Pat. No. 5,045,522. This application Jun. 10, 1991, Ser. No. 712,839

Int. Cl.[5] C01B *17/16, 31/20*

U.S. Cl. 423—230 **36 Claims**

1. A process for removing hydrogen sulfide from a fluid stream containing hydrogen sulfide comprising the step of contacting said fluid stream under absorbing conditions with an absorbing composition comprising zinc titanate, alumina, silica and a promoter metal selected from the group consisting of phosphorus, tungsten, molybdenum, metals of Group VIII

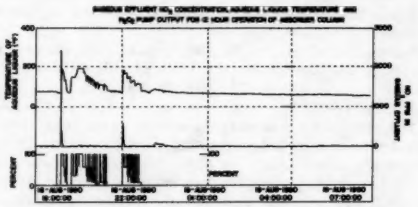
of the Periodic Table, and mixtures of any two or more thereof wherein said absorbing conditions comprise a temperature in the range of from about 150° C. to about 650° C., a total system pressure in the range of from about atmospheric to about 2000 psig and a residence time for said fluid stream in the presence of said absorbing composition in the range of from about 10 to about 10000 volumes of said fluid stream per volume of said absorbing composition per hour.

5,151,258

NO_x REDUCTION AND CONTROL USING HYDROGEN PEROXIDE IN THE ABSORBER COLUMN

David M. Gubanc, Franklin; Larry J. Liston, Westerville, and Jeffrey M. Zimmerman, Franklin, all of Ohio, assignors to General Electric Company, Worthington, Ohio

Filed May 30, 1991, Ser. No. 708,135
Int. Cl.[5] C01B *21/60*
U.S. Cl. 423—235 **10 Claims**



1. A method for removing oxides of nitrogen (NO_x) from a gaseous effluent within an absorber column, said method comprising;

(a) feeding gaseous effluent and aqueous liquor into an absorber column,

(b) contacting the gaseous effluent with the aqueous liquid within said absorber column,

(c) discharging the gaseous effluent and aqueous liquor which have contacted from said absorber column, and

(d) selectively adding hydrogen peroxide to the aqueous liquor fed into the absorber column at periods determined by an increase in the temperature of the aqueous liquid discharged from the absorber column of 1° F./30 seconds and above.

5,151,259

MODIFIED CRYSTALLINE ALUMINOSILICATE AND METHOD OF PREPARING THE SAME

Niels J. Blom, Hillerod, Denmark, assignor to Haldor Topsoe A/S, Denmark

Filed Dec. 18, 1990, Ser. No. 629,634
Claims priority, application Denmark, Dec. 22, 1989, 6666/89
Int. Cl.[5] C01B *33/34*
U.S. Cl. 423—328 **20 Claims**

1. A crystalline aluminosilicate having in its anhydrous state a formula expressed in terms of mole ratios as follows:

$$xQ: 0.01\text{–}0.1\ M_{2/n}O{:}0\text{–}0.8\ Z_2O_3{:}SiO_2{:}0.0001\text{–}0.5\ MeS,$$

wherein:

Q is an organic nitrogen compound;

Z is aluminum, boron, gallium or mixtures thereof;

x is between 0 and 0.5;

M is at least one metal cation of valence n; and

Me is at least one of the metals which form an insoluble sulfide compound homogeneously distributed within said crystalline aluminosilicate.

5,151,260

PROCESS FOR PREPARING FINE POWDERS OF ALUMINUM NITRIDE

Luigi Contursi, Lugo, and Leandro Beaulardi, Imola, both of Italy, assignors to Temay S.p.A., Venice, Italy

Filed Dec. 19, 1990, Ser. No. 629,997
Claims priority, application Italy, Dec. 21, 1989, 22793 A/89
Int. Cl.[5] C01B *21/072*
U.S. Cl. 423—412 **6 Claims**

1. Process for preparing fine powders of aluminum nitride, by starting from an aqueous solution of an inorganic aluminum salt, wherein said process comprises:

(a) removing the anion of the inorganic aluminum salt at least partially by heating, with a colloidal solution of an aluminum compound being obtained;

(b) dispersing carbon powder in said colloidal solution, with a suspension of an aluminum compound and carbon being obtained;

(c) mixing said suspension with a carbohydrate, with a suspension being obtained of an aluminum compound and carbon in a solution which contains the carbohydrate;

(d) adding the suspension obtained from the (c) step to an alkaline solution, with spherical bodies being obtained which contain aluminum hydroxide and carbon;

(e) reducing and nitriding said spherical bodies carbothermally at a temperature of from 1350° to 1650° C. for a time of from 1 to 24 hours, so that powders containing aluminum nitride are obtained; and

(f) removing carbon from said powders by a calcination step carried out at a temperature of from 600° to 700° C., for a time of from 1 to 7 hours, under an oxygen-containing atmosphere.

5,151,261

METHOD OF PRODUCING BROMINE-TREATED GRAPHITE FIBERS

Hidenori Yamanashi, Shizuoka, Japan, assignor to Mitsubishi Corporation and Yazaki Corporation, both of Tokyo, Japan

Continuation of Ser. No. 219,635, Jul. 15, 1988, abandoned. This application Sep. 12, 1990, Ser. No. 581,267
Claims priority, application Japan, Jul. 17, 1987, 62-177244
Int. Cl.[5] C01B *31/04*
U.S. Cl. 423—448 **4 Claims**

1. A method for producing bromine-processed graphite fibers which comprises preparing gas phase grown carbon fibers by bringing a substrate carrying thereon ultrafine particles of metal catalyst into contact with a hydrocarbon compound at a temperature of 900° to 1500° C.; graphitizing the fibers at a temperature of at least 1500° C. to obtain graphite fibers having a crystal structure, said crystal structure having a carbon hexagonal network face substantially in parallel with the axis of fibers and oriented in a coaxial manner; and then bringing the graphite fibers and a liquid consisting essentially of bromine into contact with each other at a temperature of lower than 60° C. for at least 10 min., the length of the repeat distance along the c axis directions in the crystals having a specific value within a range from 10 to 40 Å.

5,151,262

PYRITE CATHODE MATERIAL FOR A THERMAL BATTERY

J. Paul Pemsler, Lexington, and John K. Litchfield, Bedford, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 7, 1991, Ser. No. 652,156
Int. Cl.[5] H01M *43/00*; C01B *17/00*
U.S. Cl. 423—561.1 **13 Claims**

1. In a process for the production of high purity synthetic pyrite by the sulfidation of iron powder at elevated temperatures, the improvement comprising the steps of:

(a) in an atmosphere of sulfur vapor and an insert gas of argon or nitrogen, reacting sulfur with iron powder at a tempera-

ture of from about 325–445° C., while mixing the reaction mass for a period of time sufficient to convert the iron powder to pyrrhotite, and

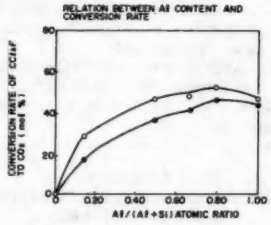
(b) in an atmosphere of sulfur vapor and an insert gas of argon nitrogen reacting the resultant pyrrhotite with sulfur vapor at a temperature of from about 475–525° C., while mixing the reaction mass for a period sufficient to convert the pyrrhotite to about 99% pure pyrite.

5,151,263

PROCESS FOR THE CATALYIC DECOMPOSITION OF CHLOROFLUORO-ALKANES

Susumu Okazaki, and Akito Kurosaki, both of Mito City, Japan, assignors to Dupont-Mitsui Fluorochemicals Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1990, Ser. No. 557,478
Claims priority, application Japan, Aug. 5, 1989, 1-202297
Int. Cl.[5] C01B *9/00*
U.S. Cl. 423—659 **3 Claims**



1. A process for the catalytic decomposition of chlorofluoro-alkanes, which comprises reacting chlorofluoro-alkanes with steam in at least the stoichiometric amount necessary for the decomposition of the chlorofluoro-alkanes to CO_2, HCl and HF in the presence of a catalyst, which catalyst is an alumina-silica complex, wherein the range of Al/(Al+Si) atomic ratio is less than 1.0, said catalyst having a surface area of at least 100 m^2/g, at the temperature of 350° C. to 650° C.

5,151,264

PARTICULATE VECTOR USEFUL IN PARTICULAR FOR THE TRANSPORT OF MOLECULES WITH BIOLOGICAL ACTIVITY AND PROCESS FOR ITS PREPARATION

Daniel Samain, Toulouse; Jean-Louis Bec, Ramonville S. Agne; Edith Cohen, L'Union; Frédérique Nguyen, and Marianne Peyrot, both of Toulouse, all of France, assignors to Centre National de la Recherch Scientifique, Paris, France

PCT No. PCT/FR89/00229, § 371 Date Jan. 26, 1990, § 102(e) Date Jan. 26, 1990, PCT Pub. No. WO89/11271, PCT Pub. Date Nov. 30, 1989
PCT Filed May 11, 1989, Ser. No. 465,068
Claims priority, application France, May 27, 1988, 88 07110
Int. Cl.[5] A61K *37/22, 9/14, 9/16, 9/50*
U.S. Cl. 424—1.1 **24 Claims**

1. Particulate carrier, characterized in that it comprises:

a hydrophilic, non-liquid core, said core having an average size of between 10 nm and 5 μm;

a first layer or ring of lipid nature bonded to the core by covalent bonds;

a second layer or outer shell of amphiphilic compounds bonded to the first lipid layer by hydrophobic interactions.

5,151,265

GAMMA INTERFERON FORMULATION

Jiin-Yu Hwang-Felgner, Los Altos; Richard E. Jones, Palo Alto, both of Calif., and James F. Maher, Broken Arrow, Okla., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 116,434, Nov. 3, 1987, abandoned. This application Apr. 25, 1990, Ser. No. 514,392
Int. Cl.[5] A61K *37/66;* C07K *13/00*
U.S. Cl. 424—85.5 **17 Claims**

1. A stable liquid pharmaceutical composition consisting essentially of an effective amount of gamma-interferon not subjected to prior lyophilization, a buffer maintaining the pH within the range of 4.0 to 6.0, a stabilizing agent, a non-ionic detergent and water, in which said gamma-interferon essentially retains its physical stability and biological activity during storage at a temperature of between about 2° and about 8° C. for a period of at least 14 months.

5,151,266

USE OF ANIONIC DETERGENTS WITH CONJUGATES OF MONOCLONAL OR POLYCLONAL ANTIBODIES

A. Charles Morgan, Jr., and Gowsala Pavanasasivam, both of Edmonds, Wash., assignors to NeoRx Corporation, Seattle, Wash.

Continuation of Ser. No. 767,493, Aug. 20, 1985, abandoned. This application Dec. 22, 1988, Ser. No. 291,420
Int. Cl.[5] A61K *39/395*
U.S. Cl. 424—85.8 **43 Claims**

1. A method for increasing the solubility of an immunoreactive immunoconjugate preparation without substantially affecting the immunoreactivity of the preparation, comprising:

incubating the immunoreactive immunoconjugate preparation with ananionic detergent at a concentration between about 0.01% and 1% by weight to volume; and

removing substantially any unbound anionic detergent.

5,151,267

BOVINE HERPESVIRUS TYPE 1 POLYPEPTIDES AND VACCINES

Lorne Babiuk; Sylvia van den Hurk, both of Saskatoon, Canada; Tim Zamb, Lincoln, Nebr., and David Fitzpatrick, Saskatoon, Canada, assignors to University of Saskatchewan, Saskatoon, Canada

Filed Jul. 15, 1988, Ser. No. 219,939
Int. Cl.[5] A61K *39/12;* C07K *7/06, 7/08;* C12N *7/00*
U.S. Cl. 424—89 **17 Claims**

1. A method of protecting a bovine host from bovine herpesvirus type 1 (BHV-1) infection comprising:

(a) providing a vaccine composition consisting essentially of (i) a pharmaceutically acceptable vehicle and (ii) at least one recombinant polypeptide comprising a polypeptide neutralizing epitope of a BHV-1 glycoprotein selected from the group consisting of gI, gIII, and gIV; and

(b) administering an effective amount of said vaccine composition to said bovine host whereby neutralizing anti-BHV-1 antibodies are elicited in said bovine host.

5,151,268

METHODS OF USING RECOMBINANT HUMAN PROTEIN C

Nils U. Bang; Robert J. Beckmann; S. Richard Jaskunas, all of Indianapolis; Mei-Huei T. Lai, Carmel; Sheila P. Little; George L. Long, both of Indianapolis, and Robert F. Santerre, Zionsville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 699,967, Feb. 8, 1985, Pat. No. 4,775,624. This application Jul. 5, 1988, Ser. No. 215,112
Int. Cl.[5] A61K *37/24;* C12N *9/64, 15/57;* C12Q *1/37*
U.S. Cl. 424—94.64 **6 Claims**

1. A method of treating and preventing protein C related vascular disorders by administering an effective amount of protein C produced by the method comprising:

A. transforming a CHO-Kl or HepG-2 host cell with a recombinant DNA vector, said vector comprising:

i) a DNA sequence that provides for autonomous replication or chromosomal integration of said vector in said host cell;

ii) a promoter and translational activating sequence functional in said host cell;

iii) a constructed DNA compound that comprises a DNA that encodes a polypeptide with human protein C activity positioned in transcriptional and translational reading phase with said promoter and translational activating sequence; and

B. culturing said host cell transformed in Step A under conditions suitable for gene expression.

5,151,269

TOPICAL ANESTHETIC COMPOSITION COMPRISING A CAPPED POLYOXYALKYLENE ALCOHOL

James N. Greenshields, Hockessin, and Peter P. Walters, Claymont, both of Del., assignors to Imperial Chemical Industries PLC, Wilmington, Del.

Filed Aug. 8, 1988, Ser. No. 229,589

Claims priority, application United Kingdom, Aug. 10, 1987, 8718886

Int. Cl.[5] A61K *7/16, 7/44, 7/32, 7/15*

U.S. Cl. 424—401 **10 Claims**

1. A composition for external use which contains at least one cosmetically or pharmaceutically active ingredient and which also contains from 10 ppm by weight up to 10% by weight of a compound of the general formula:

$$RO(AO)_xR^1$$

wherein:

A is a C_1–C_4 alkylene group;

R is phenyl, tolyl, benzyl or C_9–C_{13} alkyl; optionally substituted with halogen, nitro, cyano, a group of the formula OR^2, SR^2 or NR^2R^3 wherein R^2 and R^3 are C_1–C_{30} alkyl;

R^1 is phenyl, tolyl, benzyl or C_1–C_{13} alkyl; optionally substituted with halogen, nitro, cyano, or a group of the formula OR^2, SR^2 or NR^2R^3 wherein R^2 and R^3 are C_1–C_{30} alkyl; and

x has a value of 2–30.

5,151,270

SELF-EMULSIFIABLE DERMATOLOGIC CREAM

Georges S. Grimberg, 123 rue de l'Université , 75007 Paris, France

Filed Nov. 30, 1989, Ser. No. 443,407

Claims priority, application France, Dec. 2, 1988, 88 15827; Jun. 15, 1989, 89 07953

Int. Cl.[5] A61K *7/48, 7/02*

U.S. Cl. 424—401 **2 Claims**

1. A self-emulsifiable, thixotropic dermatologic cream, produced by the following process:

first, mixing the following products at room temperature:

Sorbitan monostearate	8.55 g
Polyoxyethylenated sorbitan monostearate	8.55 g
Stearic acid	31.8 g
Petrolatum oil	17.1 g
Isopropyl myristate	42.0 g
Magnesian yeast	4.0 g
Triethanolamine	0.424 g
Methyl parahydroxybenzoate	0.159 g
Propyl parahydroxybenzoate	0.159 g
Distilled water	283.5 g
Fragrance	1.720 g

heating the mixture to a temperature between 80° C. and 120° C. for a period of time of 15 to 75 minutes, such that said products are all melted and solubilized; and

allowing the mixture to cool down while stirring.

5,151,271

PRESSURE-SENSITIVELY ADHERING COMPOSITE MEDICINAL PREPARATION

Saburo Otsuka; Yuusuke Ito; Toshiyuki Yoshikawa, and Shoichi Tokuda, all of Ibaraki, Japan, assignors to Nitti Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 224,214, Jul. 25, 1988, abandoned, which is a continuation of Ser. No. 406,726, Aug. 9, 1982, abandoned. This application Oct. 24, 1989, Ser. No. 426,526

Claims priority, application Japan, Aug. 27, 1981, 56-134888; Aug. 27, 1981, 56-134889

Int. Cl.[5] A61F *13/00*

U.S. Cl. 424—443 **11 Claims**

1. A process for the preparation of a pressure-sensitively adhering composite medicinal preparation which

(1) comprises at least two layers, said layers being (a) a layer of a macromolecular substance, whose glass transition point is within the range from −70° C. to −10° C., having pressure-sensitive adhesiveness at ordinary temperatures and (b) a polymer layer, whose glass transition point is within the range from −50° C. to 75° C., said polymer layer being adjacent to said macromolecular substance layer,

(2) one of the said layers (a) and (b) contains a percutaneously absorbable drug and other of said layers contains an adjuvant capable of increasing percutaneous drug absorption, and

(3) the drug and adjuvant respectively can immigrate into the adjacent macromolecular substance layer and polymer layer, the process comprising lamenating one of layer (a) and (b) which contains a percutaneously absorbable drug to the other layer which contains an adjuvant capable of increasing percutaneous drug absorption.

5,151,272

METHOD OF PREPARING CONTROLLED-RELEASE PREPARATIONS FOR BIOLOGICALLY ACTIVE MATERIALS AND RESULTING COMPOSITIONS

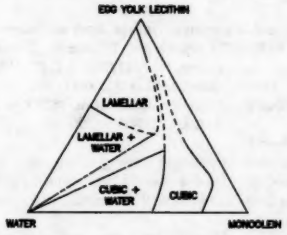
Sven Engstrom; Bjorn Lindman, both of Lund, and Kare Larsson, Bjarred, all of Sweden, assignors to Fluid-Carbon International AB, Malmo, Sweden

Continuation of Ser. No. 166,759, Mar. 3, 1988, abandoned, which is a continuation of Ser. No. 638,221, Jul. 26, 1984, abandoned. This application Jun. 18, 1990, Ser. No. 540,441

Claims priority, application Sweden, Nov. 26, 1982, 8206744

Int. Cl.[5] A61K *9/127, 37/22;* **B01J** *13/06*

U.S. Cl. 424—450 **40 Claims**



1. A composition for controlled release of selected bioactive material, in vivo; the composition comprising:

(a) a cubic liquid crystalline phase formed from monoglyceride material and water; said cubic liquid crystalline phase comprising a lipid bilayer and a hydrophilic domain; and,

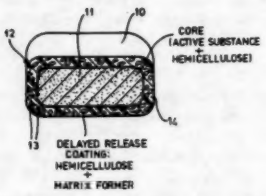
(b) an effective amount of selected bioactive material received within the hydrophilic domain of the cubic liquid crystalline phase.

5,151,273

DELAYED-RELEASE PHARMACEUTICAL PREPARATION

Brigitta Korsatko-Wabnegg; Werner Korsatko, both of Graz, and Karlheinz Wegleitner, Linz, all of Austria, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

Filed Mar. 29, 1991, Ser. No. 676,977
Claims priority, application Austria, Apr. 4, 1990, A803/90
Int. Cl.[5] A61K *9/20*
U.S. Cl. 424—465 6 Claims



1. A delayed-release enterally active pharmaceutical preparation in a dosage form, comprising a core and a covering, at least one pharmaceutically effective active substance in said core capable of enteral administration and a release-delaying composition forming said covering and which comprises hemicellulose in combination with a non-disintegrating matrix-forming adjuvant, said non-disintegrating matrix-forming adjuvant being poly-D(−)-3-hydroxybutyrate-cohydroxyvalerate, the weight ratio of the hemicellulose to the poly-D(−)-3-hydrosybutyrate-cohydroxyvalerate in said composition being 5:95 to 20:80.

5,151,274

CALCIUM AND TRACE MINERAL SUPPLEMENTS

Paul D. Saltman, La Jolla, Calif., and Kenneth T. Smith, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio and Regents of the University of California, Oakland, Calif.

Filed Aug. 6, 1990, Ser. No. 562,773
Int. Cl.[5] A61K *33/06, 33/30, 33/32, 33/34*
U.S. Cl. 424—630 17 Claims

1. A method, for building of bone in a human subject suffering from age-related bone loss comprising administering to said subject a safe and effective amount of a mineral supplement comprising calcium citrate malate, zinc, manganese and copper salts for a sufficient period of time to build bone in said subject.

5,151,275

SEALING CONSTRUCTION FOR A PRESSURE CASTING MOLD

Takeshi Ito, and Kazushige Murata, both of Iokonami, Japan, assignors to INAX Corporation, Tokoname, Japan

Continuation-in-part of Ser. No. 381,050, Jul. 17, 1989, Pat. No. 5,046,937. This application May 22, 1991, Ser. No. 704,199
Claims priority, application Japan, Jun. 28, 1990, 2-69283[U]
Int. Cl.[5] B28B *13/00*
U.S. Cl. 425—84 3 Claims

1. A mold used in pressure casting comprising:

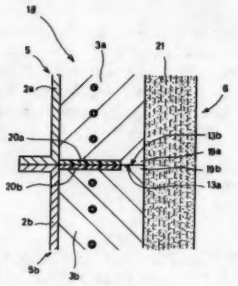
a first mold unit, and a second mold unit contacting each other to form an exterior of the mold and forming an inner open space,

each of said mold units including an inner porous filter medium layer,

said first mold unit and said second mold unit having abutting surfaces,

said abutting surfaces being made up of first portions and second portions,

said first portions being made up of the same material as the inner porous filter medium layers, and extending part way from said inner space toward the exterior of the mold, and said second portions are made up of sealing members located between said porous filter medium layers of said mold



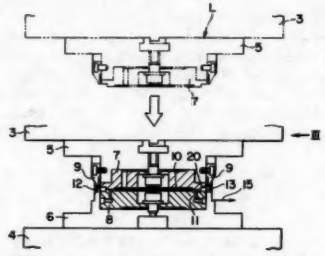
units and extending between said first portions and the exterior of the mold.

5,151,276

RESIN MOLDING APPARATUS

Mitsuo Sato, Zama; Hazime Shaura, and Megumi Tateishi, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1990, Ser. No. 634,447
Claims priority, application Japan, Feb. 13, 1990, 2-31788
Int. Cl.[5] B29C *45/14*
U.S. Cl. 425—110 12 Claims



1. A resin molding apparatus for molding an insulating resin mold at the peripheral portion of a semiconductor wafer comprising:

an upper metallic mold having an upper mold contact surface in contact with the semiconductor wafer,

a lower metallic mold having a lower mold contact surface in contact with the semiconductor wafer, and for clamping the semiconductor wafer with the upper metallic mold, and

first and second resin stoppers;

wherein the upper lower metallic molds form a resin space therebetween which is to be filled with insulating resin through an injection port at the portion corresponding to the peripheral portion of the semiconductor wafer,

the upper mold contact surface, the lower mold contact surface and the inner surface of the resin space are coated with an elastic material which does not adhere to the insulating resin;

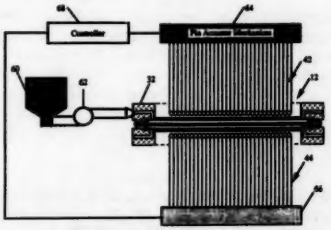
the resin space communicates with the outside environment through the injection port and a discharge port,

the first resin stopper cooperates with the injection port to close an upper portion of the injection port, and the second resin stopper cooperates with the discharge port to close an upper portion of the discharge port.

5,151,277
RECONFIGURABLE FIBER-FORMING RESIN TRANSFER SYSTEM

Edward Bernardon, Bedford, and Michael F. Foley, Cambridge, both of Mass., assignors to The Charles Stark Draper Lab., Inc., Cambridge, Mass.

Filed Mar. 27, 1991, Ser. No. 675,819
Int. Cl.[5] B29C *45/14*
U.S. Cl. 425—112 8 Claims



1. A reconfigurable fiber-forming resin transfer molding system comprising:

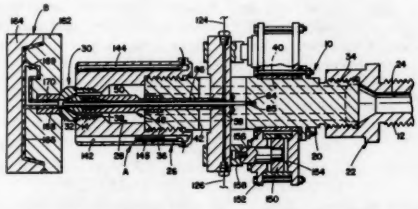
a chamber including opposing flexible first and second spaced diaphragms, means for sealingly engaging the edges of the diaphragms, means for disposing an initially generally planar fiber workpiece between the diaphragms dividing the chamber into two sections, and means for introducing into at least one section a resin for impregnating said workpiece; and

press and die means surrounding said chamber for embracing said chamber and forming a contained workpiece to conform to the shape of the press and die.

5,151,278
PLASTIC INJECTION MOLDING NOZZLE WITH GAS ASSIST

Indra R. Baxi, Solon, and Tom W. Johnson, Hunting Valley, both of Ohio, assignors to Nitrojection Corporation, Middlefield, Ohio

Filed Apr. 9, 1991, Ser. No. 682,616
Int. Cl.[5] B29C *45/23*
U.S. Cl. 425—130 19 Claims



1. An apparatus for injecting a viscous fluid and a non-viscous fluid into a mold cavity of a mold body, the apparatus comprising:

a nozzle body comprising an inlet end and a discharge end, and a flow passage for the viscous fluid extending from said inlet end to said discharge end;

a valve element mounted for reciprocation in said nozzle body flow passage to control a flow of the viscous fluid through said nozzle body discharge end, said valve element comprising:

a barrel having a first end, selectively engaging a portion of the nozzle body discharge end to prevent a flow of the viscous fluid therepast and a second end, and

a bore extending longitudinally through said barrel;

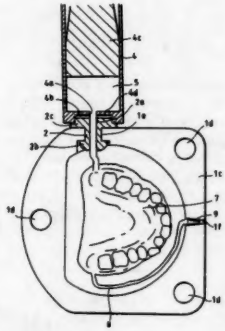
a pin located in said barrel bore, said pin having a first end located adjacent said barrel first end and a second end secured to said nozzle body such that said pin remains stationary as said barrel reciprocates in said nozzle body; and,

a non-viscous fluid flow passage defined between said pin and said barrel, wherein said barrel bore has a substantially constant diameter at and adjacent said barrel first end.

5,151,279
METHOD FOR MAKING RESIN DENTAL PLATES AND FLASKS

Hiroshi Kimura, No. 9-12, 5 Chome, Minamikasugaoka, Ibaraki-shi, Osaka, Japan

Continuation of Ser. No. 430,573, Nov. 1, 1989, abandoned. This application Sep. 6, 1991, Ser. No. 758,510
Claims priority, application Japan, Nov. 2, 1988, 63-276088
Int. Cl.[5] B29C *45/18*
U.S. Cl. 425—178 7 Claims



1. A flask comprising:

a splittable flask body which comprises an upper lid member, a tray member and a lower lid member, all formed of a material through which microwaves are transmittable,

an injection attachment mounted on a mounting port formed of axially aligned cut-out portions of said tray member and said lower lid member and having an axial resin injection hole, and a sprue-opening closure member for closing said resin injection hole in said injection attachment,

a cylinder filled with a pasted resin and a plunger positioned in said cylinder for injecting said resin into said resin injection hole, said cylinder having an end wall with an outlet hole formed therein and a recessed portion formed on a side of said wall opposite said plunger; and

said flask body being provided in the vicinity of a side edge thereof with at least two through-holes and tightening means inserted into said through holes, wherein said tightening means comprises securing members, each formed of a material through which microwaves are transmittable, and wherein said injection attachment is provided with a resin injection hole and with inner and outer stopper members formed of a material through which microwaves are transmittable in such opposite relation as to hold therebetween a wall region of the side of said flask body, said outer stopper member being positioned in said recessed portion formed at said one end of said cylinder.

5,151,280

PELLETIZING MACHINE

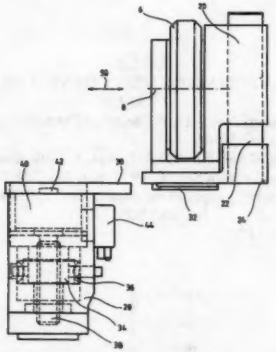
Ulrich Arndt; Lauenburg; Peter Lüneburg, Berkenthien; Kurt Marquardt, Hamburg; Hans-Joachim Pierags, Lübeck, and Ulrich Zeuschner, Schwarzenbek, all of Fed. Rep. of Germany, assignors to Firma Wilhelm Fette GmbH, Schwarzenbek, Fed. Rep. of Germany

Filed Mar. 8, 1991, Ser. No. 667,017

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1990, 4018453

Int. Cl.[5] B30B *11/08*

U.S. Cl. 425—186 8 Claims



1. A rotary pelletizing machine, comprising a rotatable matrix disc; a plurality of upper and lower plungers guided in said matrix disc; a plurality of vertically adjustable pressing rollers which control position of said upper and lower plungers; a drive housing; a drive in said drive housing for a height adjustment of said rollers; a bearing block supporting said pressing rollers; and means for releasably connecting said bearing block and therefore said pressing rollers supported in said bearing block with said drive housing of said drive for a height adjustment to facilitate exchange of said matrix disc.

5,151,281

DEVICE FOR CONTINUOUS MANUFACTURE OF BENT RODS WITH SHAPED CROSS SECTIONS USING AN INTERMEDIATE STRIP

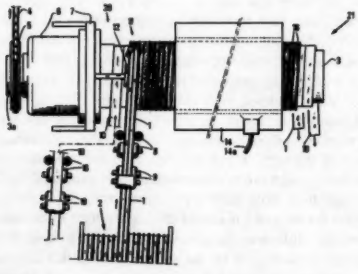
Michel Huvey, Bougival, France, assignor to Institut Francais du Petrole, Reuil-Malmaison, France

Continuation of Ser. No. 269,071, Nov. 9, 1988, abandoned. This application Mar. 12, 1990, Ser. No. 491,838

Claims priority, application France, Nov. 9, 1987, 87 14965

Int. Cl.[5] B29C *41/04*

U.S. Cl. 425—505 15 Claims



1. Apparatus for continuous manufacture of bent rods with shaped cross section, the apparatus comprising a mandrel, mans for rotating said mandrel around a longitudinal axis thereof, a supporting mold adapted to be wound around the mandrel, said mandrel having a cross section matching that of the shaped cross sections of the bent rods to be produced, mans for continuously winding the supporting mold on the mandrel, means for continuously winding reinforcing elements impregnated with stabilizable material within the supporting mold, stabilizing means extending over at least a part of a length of said mandrel, means for separating the shaped section of reinforcing elements with stabilizable material from the mandrel after the material has been subjected to at least partial stabilization, a helical intermediate strip disposed between said mandrel and said supporting mold, means for continuously winding said intermediate strip on said mandrel, means for causing said intermediate strip to progress longitudinally along said mandrel, and means for separating said intermediate strip from said mandrel.

5,151,282

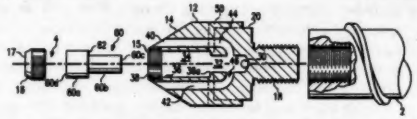
POSITIVE-TYPE NON-RETURN VALVE

Robert F. Dray, Rte. No. 1, Box 281 D, Hamilton, Tex. 76531

Filed May 13, 1991, Ser. No. 699,277

Int. Cl.[5] B29C *45/23*

U.S. Cl. 425—562 21 Claims



1. A non-return valve for use with a feed screw in a barrel with an axis, said barrel defining an accumulation area downstream of said non-return valve, said valve comprising:

a) a frame with a distal end and a proximal end, said frame defining a primary chamber located in said frame, said primary chamber in fluid communication with said accumulation area;

b) a reduced diameter passage located in said frame upstream from and in contact with said primary chamber;

c) at least one inlet connected to said reduced diameter passage and leading to an outer surface of the proximal end;

d) at least one outlet passage extending from said reduced diameter passage to an outer surface on said distal end of said frame; and

e) a piston within said primary chamber, said piston having a first portion, a second portion, an upstream face, and a downstream face, said piston dimensioned to slidably engage said primary chamber and reduced diameter passage, said piston having an open position to allow communication between said at least one inlet and said at least one outlet passage and a closed position to seal said at least one outlet passage from said at least one inlet.

5,151,283

HIGH SOLUBLE FIBER BARLEY EXPANDED CEREAL AND METHOD OF PREPARATION

Karen B. Foehse; John D. Efstathiou, both of Plymouth, and James R. Stoll, Maple Grove, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 437,229, Nov. 16, 1989, Pat. No. 5,063,078 which is a continuation-in-part of Ser. No. 330,245, Mar. 29, 1989, Pat. No. 5,063,078, which is a continuation-in-part of Ser. No. 446,247, Dec. 5, 1989, Pat. No. 5,024,996. This application Jul. 3, 1990, Ser. No. 548,463

Int. Cl.[5] A23L *1/18*

U.S. Cl. 426—93 30 Claims

1. A puffed ready-to-eat cereal product of superior eating quality which is high in soluble fiber, comprising a puffed, cooked cereal dough composition including:

A. about 15% to 90% by weight of the composition of a

barley extraction flour having a soluble fiber content of about 15% to 50% by weight of the flour;

B. about 2% to 4% moisture by weight of the composition, and the balance of the composition of a farinaceous material;

wherein the product has a bulk density ranging from about 0.05 to 0.15 g/cc,

wherein the insoluble fiber content is less than 7% by weight, and

wherein the soluble fiber to insoluble fiber content is in a ratio of at least 1:1.

5,151,284

METHOD OF PREPARING GREEN BEANS AND THE RESULTING PRODUCT

Jeffrey R. Twyman, 893 W. Wooster St., Bowling Green, Ohio 43402

Continuation-in-part of Ser. No. 38,501, Apr. 15, 1987, Pat. No. 4,867,996. This application Jan. 14, 1988, Ser. No. 143,841

Int. Cl.[5] A23L *1/212*; A23B *7/154*

U.S. Cl. 426—106 **4 Claims**

1. A plastic bag and a plurality of green beans therewithin, the bag having walls of about ½ to 3 mils in thickness, the walls being permeable to O_2 and moisture, the green beans being treated to reduce deterioration normally encountered in storage and on sale as fresh produce, the beans being stabilized against rapid deterioration by immersing freshly picked green beans in water at a temperature and for a time sufficient to clean, partially sterilize and preserve the green beans and thereafter, before placing the beans in the plastic bag, removing surface water on each of the beans at a temperature effective to thereby provide the beans with a shelf life of about 5 to 10 days as compared to only 2 days for untreated green beans.

5,151,285

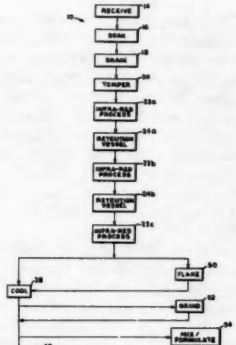
COMESTIBLE PROCESSING SYSTEM AND METHOD

Rick L. Williams; Merton R. Leggott, both of Lincoln, Nebr., and Richard G. Bailey, Overland Park, Kans., assignors to Flakee Mills, Inc., Lincoln, Nebr.

Filed May 6, 1991, Ser. No. 695,648

Int. Cl.[5] A23L *1/00*; H05B *6/00*

U.S. Cl. 426—241 **23 Claims**



11. A method of processing a food material into a comestible product, which includes the step of:

(a) receiving said material;

(b) soaking said material;

(c) energizing said material with energy in the infrared range sufficient to partially cook the material;

(d) retaining at least a portion of said energy in said by means of a heated retention vessel to further cook the material; and

(e) cooling said material.

5,151,286

PROCESS FOR PACKAGING ACIDIFIED VEGETABLE

James Adams, Hartland, and Frank J. Meczkowski, Farmington Hills, both of Mich., assignors to Campbell Soup Company, Camden, N.J.

Continuation-in-part of Ser. No. 494,214, Mar. 15, 1990, abandoned. This application Mar. 26, 1991, Ser. No. 675,164

Int. Cl.[5] A23B *7/10*

U.S. Cl. 426—324 **7 Claims**

1. A process for packaging an acidified vegetable exhibiting a fresh deli-type flavor, said process consisting essentially of the steps of:

contacting a fresh vegetable with a quick equalization brine for less than about 4 hours to produce an acidified vegetable having a pH of less than about 4.5 and which exhibits a fresh deli-type flavor, said brine comprising salt in an amount within the range from about 4% to about 12% and either acetic acid or a mixture of acetic acid and phosphoric acid;

separating said acidified vegetable from said brine;

transferring said acidified vegetable to a sealable package that is opaque to the transmission of light through said package; and

sealing said acidified vegetable in said package having oxygen and carbon dioxide concentrations in the package atmosphere equal to that of ambient air but in the absence of a covering brine.

5,151,287

PROCESS FOR INCREASING COFFEE EXTRACTION YIELD

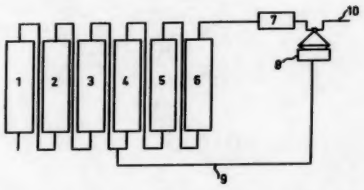
Klaus Schlecht, and Olaf Wehrspann, both of Orbe, Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Apr. 19, 1991, Ser. No. 688,054

Claims priority, application European Pat. Off., May 7, 1990, 90108583.7

Int. Cl.[5] A23F *5/26*

U.S. Cl. 426—432 **8 Claims**



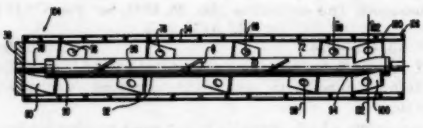
1. A process for extracting roast and ground coffee comprising introducing an extraction liquid having a temperature sufficient to hydrolyze roast and ground coffee into a countercurrent extraction system comprising a plurality of extraction cells interconnected in series and passing the extraction liquid through roast and ground coffee contained in the cells to extract the coffee to obtain an extract from the system, centrifuging the extract to separate solids suspended in the extract from the extract to obtain a sludge and then introducing the sludge into at traction cell to hydrolyze the sludge by means of the extraction liquid during extraction.

5,151,288

FOOD PROCESSING APPARATUS AND METHOD

Ernest W. Carry, Wyckoff, N.J., and Marvin F. Beach, Louisville, Ky., assignors to Besst Frozen Products, Inc., Hackensack, N.J.

Continuation of Ser. No. 598,431, Oct. 16, 1990, Pat. No. 5,030,465. This application Mar. 18, 1991, Ser. No. 671,026
The portion of the term of this patent subsequent to Jul. 9, 2008, has been disclaimed.
Int. Cl.[5] A23L *1/00*; A23G *9/00*
U.S. Cl. 426—474 18 Claims



12. A method for processing food substances, the method comprising the steps of:

mixing a gas with food substance to form a mixture;

introducing the mixture into the interior of a tube having an inlet end and an outlet end;

exposing the exterior of the tube to a fluid in order to change the temperature of the mixture within the tube; and

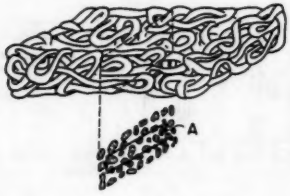
whipping the mixture by propelling a first portion of the mixture from the inlet end of the tube toward the outlet end thereof while simultaneously propelling a second portion of the mixture from a plurality of spaced apart areas within the tube, in a direction from the outlet end of the tube toward the inlet end thereof to mix the gas with the food substances.

5,151,289

PROCESS OF PREPARING FROZEN INSTANT COOKING NOODLES

Ryutaro Ozawa, Saitama; Tomoya Hayakawa, Kawagoe; Noriko Kato, Tokyo; Soichi Kobayashi, Tochigi, and Seisaku Fuse, Utsunomiya, all of Japan, assignors to Nisshin Flour Milling Co., Ltd. and MA MA-Macaroni Co., Ltd., both of Tokyo, Japan

Filed Dec. 21, 1990, Ser. No. 631,407
Claims priority, application Japan, Dec. 28, 1989, 1-338361
Int. Cl.[5] A23L *1/162, 3/36*
U.S. Cl. 426—557 10 Claims



1. A process of preparing frozen instant cooking noodles having a cross-sectional void space percent of 40 to 80% which comprises the steps of:

subjecting noodles to a α conversion so as to control a yield of the noodles within the range of 200 to 280%;

quickly cooling the α converted noodles in cold water at 0° to 5° C.;

arranging individual strings of the noodles at random to form a noodle lump having a cross sectional void space percent of 40 to 80%; and

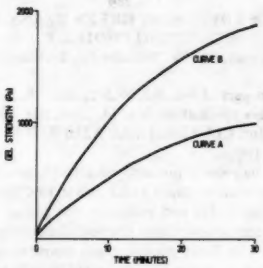
freezing the lump.

5,151,290

WATER-IN-OIL DISPERSION AND PROCESS FOR PREPARING SUCH DISPERSION

Ian T. Norton, Rushden, Great Britain, and Jeffrey Underdown, Hamburg, Fed. Rep. of Germany, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Continuation of Ser. No. 521,517, May 10, 1990, abandoned. This application Dec. 10, 1991, Ser. No. 807,023
Claims priority, application European Pat. Off., May 16, 1989, 89201209; Feb. 19, 1990, 90200386
Int. Cl.[5] A23D *7/02*
U.S. Cl. 426—576 9 Claims



1. Process for preparing a dispersion comprising a fat-continuous phase and a dispersed gelled aqueous phase comprising the steps of:

cooling a water-continuous composition containing at least 1% gelatin by weight of water from a temperature above the gel setting temperature of the water-continuous composition to a temperature below the gel setting temperature;

subjecting the water continuous composition to such conditions of shear that the water-continuous composition is converted into small gelled aqueous beads; and

forming a fat-continuous dispersion while maintaining the temperature at below the gel melting temperature either by inversion of the water-continuous composition or by combining the small aqueous beads with a separate fat-continuous stream.

5,151,291

GLYCERIDES OF EICOSAPENTAENOIC ACID, PROCESSES FOR PREPARING THE SAME AND OIL AND FAT PRODUCTS CONTAINING THE SAME

Shigeru Tokairin, Tokyo, and Tetsuo Nishimaki, Nagano, both of Japan, assignors to Nisshin Flour Milling Co., Ltd. and Tsukishima Foods Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 394,246, Aug. 15, 1989, abandoned, which is a continuation of Ser. No. 945,847, Dec. 23, 1986, abandoned. This application Jan. 16, 1990, Ser. No. 465,564
Claims priority, application Japan, Dec. 27, 1985, 60-292952
Int. Cl.[5] A23C *15/12*; A23D *7/00, 9/00*
U.S. Cl. 426—581 3 Claims

1. A product selected from the group consisting of margarine, shortening, mayonnaise, butter, dressing and edible oil, which comprises a glyceride of eicosapentaenoic acid represented by the formula

wherein R1, R2 and R3, which are the same or different, each represent eicosapentaenoyl group or an acyl radical of higher fatty acids other than eicosapentaenoic acid, provided that

either one of R_1, R_2 and R_3 represents eicosapentaenoyl group and the remaining groups are all an acyl radical of higher fatty acids other that eicosapentaenoic acid.

5,151,292

FATBLEND AND PROCESS OF PRODUCING

Nico Zwikstra, Heemstede, Netherlands, assignor to Van den Bergh Foods Co., Division of Conopco Inc., Lisle, Ill.

Continuation of Ser. No. 454,336, Dec. 21, 1989, abandoned. This application Jan. 6, 1992, Ser. No. 818,420
Int. Cl.[5] A23D *9/00*
U.S. Cl. 426—601 14 Claims

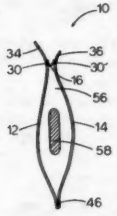
1. Fatblend, useful in chocolate compositions, comprising a mid-fraction of hardened, fractionated soybean oil, BO, and a mid-fraction of hardened, fractionated cottonseed oil, CS, wherein the weight ratio BO/CS of the two mid-fractions is 10:90–40:60.

5,151,293

SIMULATED RAW EGG AND METHODS OF MAKING AND PACKAGING

Eustathios Vassiliou, 12 S. Townview La., Newark, Del. 19711

Continuation-in-part of Ser. No. 551,160, Jul. 11, 1990, Pat. No. 5,073,399. This application Aug. 26, 1991, Ser. No. 750,116
Int. Cl.[5] A23L *1/32, 1/04*
U.S. Cl. 426—614 11 Claims



1. A simulated raw egg comprising:

egg-white, the egg-white being liquid at room temperature and containing an additive solute; and

a homogeneous shaped monolithic separate phase of a simulated non-flowable, egg-yolk disposed in the egg-white, said egg-yolk comprising an edible liquid, a colorant, and a positive thermoreversible gel former, the gel former being in an effective amount to render the egg-yolk

non-flowable, as to substantially retain its monolithic status in, and be substantially immiscible with the liquid egg-white at room temperature after the egg-yolk has been chilled, and

flowable at serving temperatures between cooking temperatures and room temperature for at least a finite period of time, after the egg-yolk has been brought to said serving temperatures from a higher temperature at which the egg-yolk becomes flowable;

the egg-yolk being characterized by an initial weight gain rate when it is in the egg-white in the absence of the additive solute; and

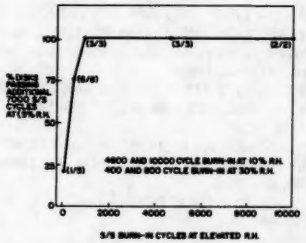
the additive solute being in an effective amount to decrease the initial weight gain rate by at least 10%.

5,151,294

METHOD FOR FORMING A PROTECTIVE FILM ON A SLIDER AIR BEARING SURFACE IN A MAGNETIC RECORDING DISK FILE

Herman E. Bleich, Morgan Hill; Luis P. Franco, Gilroy, and Ian L. Sanders, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 616,719, Nov. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 416,758, Oct. 3, 1989, abandoned. This application Nov. 19, 1991, Ser. No. 795,283
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—11 7 Claims



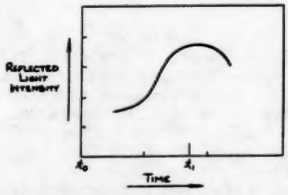
1. A method for depositing a film of essentially amorphous carbon on the air bearing surface of a slider in a magnetic recording disk file, the disk file being of the type wherein the disk associated with said slider has a thin film metal alloy or metal oxide magnetic layer and an essentially amorphous carbon protective overcoat, the method comprising the steps of causing the slider to move to a nondata region on the disk not accessible by the slider during normal operation of the disk file, and maintaining the disk at a rotational speed less than the speed required to cause the slider to ride on the air bearing by repetitively starting and stopping rotation of the disk while maintaining the air bearing surface of the slider in continuous contact with the carbon overcoat of the disk for a period of time sufficient to transfer carbon from the disk overcoat to the slider air bearing surface.

5,151,295

PROCESS FOR MANUFACTURING AN OPTICAL RECORDING MEDIUM

Katsumi Kawahara; Masami Uchida, both of Osaka; Kazumi Yoshioka, Kyoto; Takeo Ohta, Nara, and Keiichiro Horai, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 18, 1990, Ser. No. 599,692
Claims priority, application Japan, Jul. 11, 1990, 2-153250
Int. Cl.[5] B05D *5/06*
U.S. Cl. 427—12 27 Claims



1. A method for depositing a thin film layer of a multi-layer structure to a desired thickness during a thin film deposition process comprising the steps of:

(a) depositing said thin film layer onto a substrate;

(b) illuminating said substrate with incident light during said deposition;

(c) monitoring the intensity of said incident light which interacts with said substrate during deposition of said thin film layer, said intensity varying in accordance with the thickness of said thin film layer;

(d) determining a time period corresponding to a predetermined variation in said intensity and calculating therefrom a deposition rate; and

(e) continuing to deposit said thin film layer to said desired thickness by controlling said thin film deposition process for a time in accordance with said calculated deposition rate.

5,151,296

METHOD FOR FORMING POLYCRYSTALLINE FILM BY CHEMICAL VAPOR DEPOSITION PROCESS

Hiroyuki Tokunaga, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

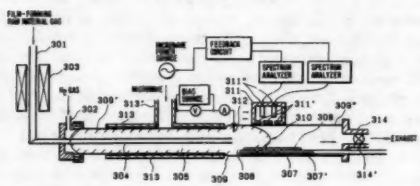
PCT No. PCT/JP90/00433, § 371 Date Nov. 28, 1990, § 102(e) Date Nov. 28, 1990, PCT Pub. No. WO90/12126, PCT Pub. Date Oct. 18, 1990

PCT Filed Mar. 30, 1990, Ser. No. 613,705

Claims priority, application Japan, Mar. 31, 1989, 1-81107; Sep. 22, 1989, 1-247262

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—38 **8 Claims**



1. A method for forming a polycrystalline film, comprising the steps of:

(i) contacting hydrogen gas with an activating energy in a space different from a film forming space of a film forming chamber in which a substrate for film formation is arranged to excite the hydrogen gas into an active species (H),

(ii) introducing said active species (H) into the film forming chamber while simultaneously introducing a film forming raw material gas into the film forming chamber, independently from the active species (H),

(iii) mixing and contacting the active species (H) with the film forming raw material gas to produce a plasma region in the film forming space maintained at a predetermined pressure, and

(iv) periodically changing the distribution of the concentration of the active species (H) near the substrate maintained at a predetermined temperature.

5,151,297

THERMOPLASTIC ACRYLIC COATED STEEL SHEET

Douglas J. Robbins, Hamilton; Cynthia A. Gosselin, and Frederick A. Myers, both of Middletown, all of Ohio, assignors to Armco Steel Company, L.P., Middletown, Ohio

Filed Mar. 26, 1990, Ser. No. 499,230

Int. Cl.[5] B05D *3/02, 1/28, 7/14*

U.S. Cl. 427—46 **5 Claims**

1. A method of forming a dry lubricant coating on steel ready for deep drawing, including the steps of:

providing a steel sheet,

the surfaces of said sheet being uncoated or metallic coated,

providing an aqueous solution of a thermoplastic polymer,

said thermoplastic polymer consisting essentially of acrylic and small amounts of auxiliary substances from the group of a rust inhibitor, a wetting agent, a wax and an antifoaming agent,

roll coating a continuous liquid film of said solution onto at least one side of said sheet,

inductively heating said sheet to a temperature of about 149°–246° C. for no more than 10 seconds to form a coating containing more than 50 wgt. % of said acrylic polymer,

the outer coated surface of said sheet being dry and tack free,

said coating being impervious to moisture, oil, dirt, and capable of being welded and adhesively bonded,

said coated sheet being ready for deep drawing without additional external lubricant.

5,151,298

PROCESS FOR PREPARING ORIENTATION FILM FOR LIQUID CRYSTALS

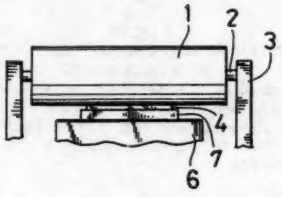
Akihiro Nammatsu, Tenri; Mitsuo Ishii, Yamatokoriyama, and Shigehiro Minezaki, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 30, 1989, Ser. No. 357,967

Claims priority, application Japan, May 30, 1988, 63-132476

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—77 **16 Claims**



1. A process for preparing an orientation film for liquid crystals which comprises:

forming a base layer of a thermoplastic or non-thermoplastic resin, to be used for the orientation film, on a substrate for a liquid crystal display, and

rubbing the base layer while simultaneously heating the base layer at a temperature not lower than 50° C. and below the melting temperature or decomposition temperature of the resin.

5,151,299

METHOD FOR FORMING A CARBON RESISTANCE IN A PRINTED WIRING BOARD

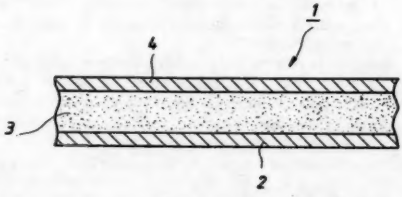
Junichi Itsuji, Saitama, Japan, assignor to Nippon CMK Corp., Japan

Filed Apr. 9, 1991, Ser. No. 682,913

Claims priority, application Japan, Apr. 17, 1990, 2-100630

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—96 **2 Claims**



1. A method for forming a carbon resistance in the circuit of a printed wiring board, comprising the steps of:

depositing a thermosettable carbon resistance layer coated on a laminated film on the surface of said circuit,

thermosetting areas of said carbon resistance layer at given positions for said circuit with the remaining areas uncured, and

removing the uncured areas of said carbon resistance layer after thermosetting.

5,151,300

METHOD FOR FORMING A CARBON RESISTANCE IN A PRINTED WIRING BOARD

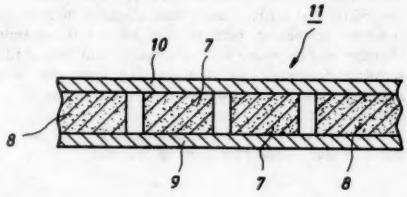
Junichi Itsuji, Iruma, Japan, assignor to Nippon CMK Corp., Japan

Filed Apr. 9, 1991, Ser. No. 682,927

Claims priority, application Japan, Apr. 17, 1990, 2-100631

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—96 **6 Claims**



1. A method for forming a carbon resistance in a circuit of a printed wiring board, comprising the steps of:

depositing carbon resistance to be used in said circuit on a laminated film in positions corresponding to the surface of said circuit,

disposing a protective film on the carbon resistance, and

removing the protective film from the carbon resistance while on said laminated film.

5,151,301

METHOD AND APPARATUS FOR APPLYING A SUBSTANCE TO AN ARTICLE

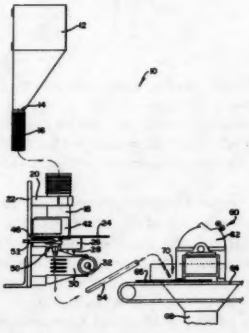
Leon J. Kruger, and John A. Oatley, both of Cape Province, South Africa, assignors to McNeil-PPC, Inc., Milltown, N.J.

Filed Jul. 23, 1991, Ser. No. 734,388

Claims priority, application South Africa, Jul. 26, 1990, 90/5894

Int. Cl.[5] B05D *7/00*

U.S. Cl. 427—294 **22 Claims**



1. A method of applying a substance to an article, which method comprises

rotating a plurality of circumferentially spaced metering chambers about an axis so that the chambers pass successively through a loading zone;

depositing a flowable substance in the chambers as they move through the loading zone so that each chamber contains a fixed quantity of the substance as it passes from the loading zone;

extracting the quantities of substance successively from the chambers in a discharge zone spaced from the loading zone, by means of suction; and

applying the extracted quantities of substance to an article.

5,151,302

METHOD FOR MAINTAINING THE INTEGRITY OF HOSIERY

Carole L. Kent, 8 Hitching Post La., Chappaqua, N.Y. 10514, and Dieter Frank, Naperville, Ill., assignors to Carole L. Kent, Chicago, Ill.

Filed Jun. 18, 1991, Ser. No. 716,904

Int. Cl.[5] B32B *35/00*

U.S. Cl. 427—140 **8 Claims**

1. A method for preventing a tear, hole or run in hosiery from expanding, comprising the step of applying as a roll-on a composition to said tear, hole or run, in an amount effective to prevent the tear, hole or run from expanding said composition comprising:

(a) nitrocellulose;

(b) resin;

(c) dioctylphthalate; and

(d) a solvent or solvent mixture.

5,151,303

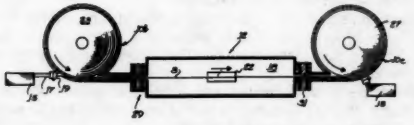
METHOD AND APPARATUS FOR USING EVACUATED, DETACHABLE WEB CONTAINERS WITH HIGH VACUUM TREATING MEANS

Crispin Hales, Winnetka, and Thomas E. Zabinski, Orland Park, both of Ill., assignors to IIT Research Institute, Chicago, Ill.

Filed Aug. 7, 1990, Ser. No. 564,023

Int. Cl.[5] B05D *3/00*; C23C *14/56*

U.S. Cl. 427—178 **2 Claims**



1. An apparatus for coating a strip or web in a high vacuum system operating in a high vacuum range of about 10^{-6} torr comprising:

container means having a dispensing reel compartment for dispensing a coiled strip and a take-up reel compartment for winding the strip into a coil;

said container means being substantially airtight and having means for being evacuated with the coiled strip therein;

means for treating the strip while at the high vacuum;

means for connection of said container means while under evacuation with said means for treating the strip without loss of the high vacuum at the treating means and at the container means;

said container means including two discrete cartridges, a first cartridge having the dispensing reel compartment, and a second cartridge having the take-up compartment.

2. A method of treating a strip of metal within a high vacuum in the range of about 10^{-6} torr, said method comprising the steps of:

providing a cartridge housing a coil of metal strip therein;

evacuating the cartridge housing with the coil strip therein;

connecting the evacuated cartridge housing to a treating housing having the high vacuum therein;

providing a take-up cartridge housing for coiling a treated strip;

evacuating the take-up cartridge housing and attaching the evacuated take-up housing to the treating housing which has a high vacuum therein;

processing the strip while in a high vacuum by a treating means in the treating housing; and

unwinding the coiled strip in the cartridge housing and coiling the treated strip in the evacuated take-up cartridge housing.

5,151,304

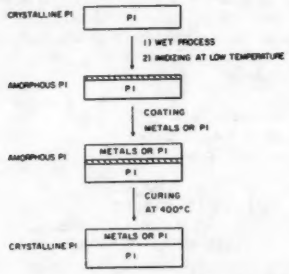
STRUCTURE AND METHOD FOR ENHANCING ADHESION TO A POLYIMIDE SURFACE

Kang-Wook Lee, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1991, Ser. No. 644,063

Int. Cl.[5] B05D *3/10*; **C23C** *14/00, 14/02*

U.S. Cl. 427—250 **14 Claims**



1. A process for forming a layer of substantially amorphous polyimide on at least part of the surface of a substantially crystalline polyimide article for subsequent coating of said article followed by recrystallizing said amorphous polyimide comprising:

treating at least a part of the surface of said substantially crystalline polyimide article with a base;

washing said base treated surface;

treating at least part of the surface of said substantially crystalline polyimide article with an acid to convert said treated substantially crystalline polyimide to polyamic acid;

heating said acid treated article to imidize said polyamic acid, thereby forming on said at least part of the surface a layer of amorphous polyimide.

5,151,305

PROCESS FOR FORMING METAL DEPOSITED FILM CONTAINING ALUMINUM AS MAIN COMPONENT BY USE OF ALKYL ALUMINUM HYDRIDE

Shigeyuki Matsumoto, Atsugi, and Osamu Ikeda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1991, Ser. No. 656,960

Claims priority, application Japan, Feb. 19, 1990, 2-036194; Feb. 19, 1990, 2-036195; Feb. 19, 1990, 2-036196; Feb. 19, 1990, 2-036197

Int. Cl.[5] C23C *16/00*

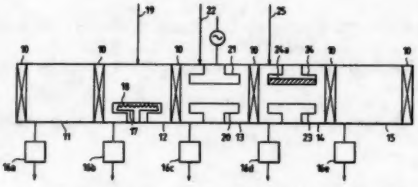
U.S. Cl. 427—252 **12 Claims**

1. A process for forming a metal film comprising the steps of:

(i) providing a substrate comprising a semiconductor or a conductor portion and an insulator portion;

(ii) disposing said substrate in a first film-forming chamber of a metal film-forming apparatus, said film-forming apparatus comprising said first film-forming chamber, a second film-forming chamber for forming a metal film and a substrate conveying path for connecting said first and said second film-forming chambers to each other while being shielded from the atmosphere;

(iii) selectively forming a first metal film comprising aluminum on said semiconductor or said conductor portion in said first film-forming chamber using an organic aluminum;



(iv) conveying said substrate on which said first metal film is formed from said first film-forming chamber through said substrate conveying path to said second film-forming chamber and disposing said substrate in said second film-forming chamber, said film-forming apparatus being shielded from the atmosphere during conveying of said substrate; and

(v) nonselectively forming a second metal film on said substrate in said second film-forming chamber.

5,151,306

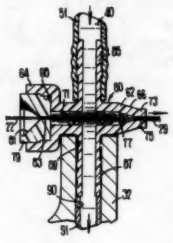
METHODS OF COATING ELONGATED STRAND MATERIAL

Jack E. Andrews, Stone Mountain; Roman J. Harmel, Lilburn; Gregory A. Lochkovic, Lawrenceville, and Francis A. Rotoloni, Alpharetta, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 26, 1990, Ser. No. 618,341

Int. Cl.[5] B05D *5/06*

U.S. Cl. 427—434.5 **3 Claims**



1. A method of coating elongated strand material, said method comprising the steps of

providing a housing which includes an entrance and an exit die each of which communicates with a chamber, and two aligned passageways, each of which opens to the chamber; and

moving an elongated strand material to advance successive increments of length of the strand material through the entrance, through the chamber and transversely past the aligned passageways and through the die; while

circulating a coating material through one of the passageways into the chamber into contact with the successive increments of length of strand material being advanced through the chamber and out through the aligned other passageway, the circulation of the coating material being effective to provide a flushing of the housing.

5,151,307

COLOR MATCH MOLDING AND WEATHERSTRIP

Norman C. Jackson, Livonia, Mich., assignor to The Standard Products Company, Cleveland, Ohio

Continuation of Ser. No. 246,511, Sep. 19, 1988, Pat. No. 4,975,306. This application Aug. 20, 1990, Ser. No. 570,008
The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.
Int. Cl.[5] B60R *13/04*
U.S. Cl. 428—31 19 Claims

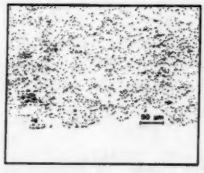
1. A molding for attachment to a vehicle, said molding comprising:
- a support member;
- a first selected colored layer secured to said support member;
- a second selected colored layer secured to said support member; and
- said first selected colored layer having a high gloss appearance matching a corresponding appearance of a portion of the vehicle.

5,151,308

HIGH DENSITY THERMAL SPRAY COATING

Larry N. Moskowitz, and Donald J. Lindley, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 392,451, Aug. 11, 1989, Pat. No. 5,019,429, which is a continuation-in-part of Ser. No. 138,815, Dec. 28, 1987, Pat. No. 4,869,936. This application Nov. 5, 1990, Ser. No. 609,250
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—35.8 5 Claims



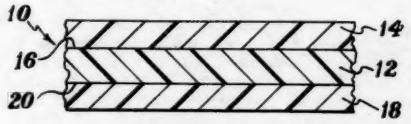
1. An article comprising a layer deposited upon a substrate wherein said layer is deposited by spray deposition on said substrate in an atmosphere containing ambient air having an oxygen content above about 1,000 parts per million by weight, wherein said layer comprises a metal alloy, the volume of voids and oxide inclusions in said layer represents less than about 1% of said layer volume, and oxide in said layer represents less than about 1% of the layer by weight, wherein said spray deposition is carried out with a thermal spray gun by directing a high velocity jet stream of hot gases carrying metal particles having a range of distribution between 10 microns and 45 microns, using hydrogen and oxygen as the combustion gases in said thermal spray gun, and wherein said high velocity jet stream carrying said metal particles is directed through a shroud effective to maintain a helically flowing stream of inert gas substantially concentrically around said particle carrying jet stream so as to essentially isolate said particle carrying jet stream from said atmosphere.

5,151,309

DIE-CUTTABLE AND DISPENSABLE DEFORMABLE LABELS

Susan E. Dollinger, Newark, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 375,566, Jul. 5, 1989, abandoned. This application Dec. 17, 1990, Ser. No. 628,796
Int. Cl.[5] B32B *7/06, 7/12, 27/32*
U.S. Cl. 428—40 27 Claims



1. A deformable label suitable for attachment to a selected substrate, comprising:
- a printable film facestock together with a usefully dispersed adhesive on one side of the facestock for affixing said film facestock to the substrate by means of the intervening adhesive, said film facestock including a layer of a polymer blend which comprises:
- a first material selected from the group consisting of high impact polystyrene, rubber-modified polystyrene, general purpose polystyrene, and mixtures thereof;
- a second material selected from the group consisting of linear low, ultra low density, low density and medium density polyethylene, copolymers of ethylene and propylene, of ethylene and acrylate monomers, of ethylene and vinyl acetate, and of ethylene and acrylic acid, and mixtures thereof; and
- a compatibilizing material;
- said adhesive being selected from the group of materials characterized by the ability to form a bond with said film facestock such that the strength of the film-adhesive interface and the substrate-adhesive interface and the cohesive strength of the adhesive itself are both greater than the forces required for deformation and recovery of the film itself; and
- a release-coated liner material releasably bonded to said adhesive.

5,151,310

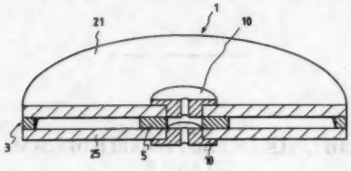
INFORMATION RECORDING MEDIUM

Shuichi Yanagisawa; Tatsuro Sakai; Yasushi Murata; Fumio Matsui, all of Saitama, and Yasuo Mitoh, Ibaraki, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo and Nitto Denko Corporation, Osaka, both of, Japan

Filed Dec. 18, 1990, Ser. No. 629,752
Claims priority, application Japan, May 28, 1990, 2-137445
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—64 6 Claims

1. An information recording medium comprising a pair of substrates each in the form of a disk, at least one of said sub-

strates has an optical recording layer on one surface thereof; said substrates being bonded to each other, directly or by



virture of a spacer, by use of a silicone adhesive so that said recording layer is disposed between said substrates;

wherein said silicone adhesive contains platinum.

5,151,311

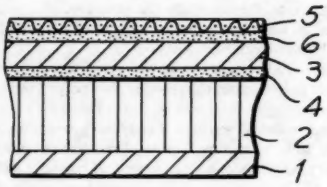
ACOUSTIC ATTENUATING LINER AND METHOD OF MAKING SAME

Charles A. Parente, Oyster Bay, and Sonya J. Westerback, North Bellmore, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation-in-part of Ser. No. 407,858, Sep. 15, 1989, abandoned, which is a continuation-in-part of Ser. No. 115,481, Nov. 2, 1987, abandoned. This application Nov. 13, 1990, Ser. No. 611,633

Int. Cl.[5] B32B *3/12*

U.S. Cl. 428—116 **8 Claims**



1. An acoustic attenuating liner, comprising

a backsheet;

a honeycomb core on said backsheet and bonded thereto, said honeycomb core being coated with a corrosion-inhibiting adhesive primer;

a perforated sheet on said honeycomb core, said perforated sheet being coated with said corrosion-inhibiting adhesive primer and having a percent open area ranging from 27 to 35% of its surface and a maximum thickness of 0.025 inch for good mass reactance;

adhesive between said perforated sheet and said core for bonding said perforated sheet to said core;

a mesh woven to a determined weave pattern from corrosion-resistant metal on said perforated sheet, said perforated sheet being reticulated; and

additional adhesive between said mesh and said perforated sheet for bonding said mesh to said perforated sheet, said additional adhesive having predetermined characteristics including a minimum viscosity of 1000 poises during curing and a predetermined thickness.

5,151,312

HOLLOW, NON-NESTABLE PACKING PEANUTS OF RECYCLED NEWSPAPER

John L. Boeri, RR 1, Box 798, Woodstock, Vt. 05091

Filed Oct. 18, 1990, Ser. No. 599,545

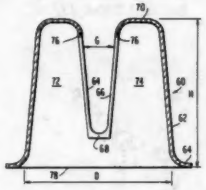
Int. Cl.[5] B65D *81/12*; B32B *3/00*

U.S. Cl. 428—156 **21 Claims**

1. A lightweight non-nestable packing peanut for use as a loose fill material in packing objects within sealed cartons, with the fill material under compression said packing peanut comprising:

a cellulose fiber, biodegradable molded hollow, thin walled shell of recycled newspaper,

said shell including means within a portion of said shell for providing shape stability thereto for resisting physical



crushing of said shell thereby structurally cushioning said packed objects, and

means for rendering said shell resilient over a portion thereof for absorbing the energy resulting from impact forces transmitted through said fill material towards said packaged objects.

5,151,313

OUTPUT SHEET FOR IMAGE FORMING DEVICE AND IMAGE FORMING DEVICE BY USE OF THE SHEET

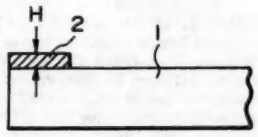
Tatsuo Takeuchi, Kawasaki, and Koji Amemiya, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1990, Ser. No. 539,887

Claims priority, application Japan, Jun. 16, 1989, 1-154122; Sep. 14, 1989, 1-238955; Sep. 29, 1989, 1-255505

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—192 **29 Claims**



1. An output sheet of an image forming device, comprising:

an output sheet having optical transparency;

a marked portion for recognition provided at an edge part of the sheet, said mark being formed by printing with a colored ink having metallic powder, wherein the marked portion of the sheet has different optical properties than the unmarked portion of the sheet, which differences are detectable by light.

5,151,314

THREE-LAYER LAMINATED PANEL

Craig C. Brown, Arlington, Tex., assignor to Johnson & Johnson Medical, Inc., Arlington, Tex.

Filed Jan. 31, 1991, Ser. No. 648,715

Int. Cl.[5] B32B *27/14*

U.S. Cl. 428—198 **13 Claims**

1. A laminated reinforcing panel for a surgical drape, comprising

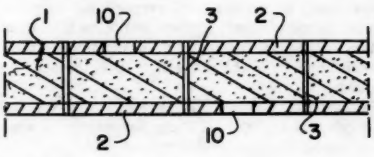
(a) a first outer layer that is liquid impermeable,
(b) an absorbent intermediate layer that overlies the first outer layer,
(c) a second outer layer that overlies the intermediate layer and is adhered to the intermediate layer by a cold cure adhesive, the second outer layer comprising a plastic web structure of spaced-apart bosses interconnected with strands, with the remaining area being open.

5,151,315

COMPOSITE MATERIAL FOR MEDICAL OR PARAMEDICAL PARTICULARLY ORTHOPAEDIC USE AND METHOD FOR MANUFACTURING IT

Tom P. M. G. Ponnet, Lode Vissenaekenstraat 2, B -2600 Berchem, Belgium

Continuation of Ser. No. 338,505, Apr. 12, 1989, abandoned, which is a continuation-in-part of Ser. No. 104,065, Oct. 5, 1987, abandoned. This application Jun. 14, 1991, Ser. No. 715,322
Claims priority, application Belgium, Oct. 8, 1986, 2/61067; Nov. 21, 1986, 2/61090; Dec. 19, 1986, 2/61130
Int. Cl.[5] B32B 7/02
U.S. Cl. 428—212 12 Claims



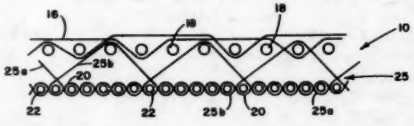
1. A multi-layer composite material for medial or paramedical use, particularly orthopaedic, which comprises a multi-layer core having two sides with a thickness between 0.05 and 25 mm and on both sides of said multi-layer core a layer of soft non-thermoplastic resilient open cell foam plastic with a thickness outside the core between 0.05 and 1.5 mm, said core being comprised of three layers: a middle layer of a thermoplastic composition containing 20 to 70 weight % polyurethane and 80 to 30 weight % polycaprolactone and two outer layers containing a higher polycaprolactone content and having a lower weakening point than said middle layer.

5,151,316

MULTI-LAYERED PAPERMAKER'S FABRIC FOR THRU-DRYER APPLICATION

Thomas B. Durkin, Depere, and Frank Bissone, Appleton, both of Wis., assignors to Asten Group, Inc., Charleston, S.C.

Continuation of Ser. No. 445,547, Dec. 4, 1989, Pat. No. 5,013,330. This application Oct. 2, 1990, Ser. No. 591,723
Int. Cl.[5] B32B 7/02
U.S. Cl. 428—213 10 Claims



1. In a papermaking apparatus having at least one thru-dryer papermaker's fabric having a paper carrying surface for forming and transporting an aqueous paper web, the improvement wherein the thru-dryer papermaking fabric comprises:
a woven base fabric layer;
a woven upper fabric layer defining the paper carrying surface which assists in the further forming of the web;
said base layer being woven in a substantially finer mesh than said upper layer from yarns having a significantly smaller size than the upper layer yarns; and
means for interconnecting said upper and base layers into a unitary fabric such that the interconnection of said base layer with said upper woven layer provides structural support and stability to said upper woven layer as it forms and transports the aqueous web.

5,151,317

BIAXIALLY-ORIENTED POLYOLEFIN MULTI-LAYER FILM WHICH CAN BE SEALED ON BOTH SIDES, AND THE PREPARATION AND USE OF THE SAME

Lothar Bothe, Mainz-Gonsenheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 5, 1990, Ser. No. 622,523
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1989, 3940173
Int. Cl.[5] B32B 7/02
U.S. Cl. 428—216 20 Claims

1. A five layer, biaxially-oriented polyolefin film having two exterior surfaces which can be sealed, comprising a base layer comprised of a propylene polymer and having a first and second surface, first and second polyolefinic intermediate layers disposed on said first and second surfaces, respectively, of said base layer, and first and second sealing layers comprised of a sealable olefin polymer and disposed on said first and second intermediate layers, respectively, wherein said first and second intermediate layers each include about 0.5 to 2.0% by weight of a polydialkylsiloxane which has a viscosity of less than about 500 mm^2/s.

5,151,318

REINFORCING MATERIAL

Dieter Strasilla, Weil am Rhein, Fed. Rep. of Germany; Richard Stössel, Allschwil, Switzerland; Rolf Müllhaupt, Freiburg, Fed. Rep. of Germany, and Ursula Kreibich, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 16, 1990, Ser. No. 523,963
Claims priority, application Switzerland, May 26, 1989, 1980/89
Int. Cl.[5] B32B 7/12, 15/04, 27/34
U.S. Cl. 428—246 9 Claims

1. A self-adhesive reinforcing material comprising
a) a UV-transparent plastic film to which
b) a woven fabric impregnated with a partially acrylate-modified epoxy resin is applied which, on the side facing away from the film a), is coated with
c) a layer of an epoxy resin which again is partially acrylate-modified, the resins of b) and c) being converted by UV irradiation to a gelled state which can be further cured by heat, and containing a heat-activatable hardener component, and
d) a release paper applied to the side opposite the film a).

5,151,319

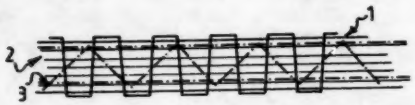
ELECTRIFIED TAPE FOR ENCLOSURE FENCES

Bruno Schoutteten, Comines, France, assignor to Schoutteten & Froidure S.A., Comine and S.A. Copel Industrie, Houplines, France

Continuation of Ser. No. 332,980, Apr. 4, 1989, abandoned. This application Jul. 26, 1991, Ser. No. 735,707
Claims priority, application France, Oct. 24, 1988, 88 14962
Int. Cl.[5] H01B 7/08
U.S. Cl. 428—257 8 Claims

1. Electrified tape for enclosure fences, comprising a flexible support layer incorporating a network of electric conductors, wherein said support layer comprises interlaced weft and warp

textures interwoven by a knitted warp including knitted stitches, with said knitted stitches enclosing said interlaced



weft and warp textures and wires of the network of electric conductors to impart dimensional stability to said network.

5,151,320

HYDROENTANGLED SPUNBONDED COMPOSITE FABRIC AND PROCESS

Edward C. Homonoff, Brooklyn; Alan W. Meierhoefer, West Hartford, both of Conn., and Lori B. Flint, Westfield, Mass., assignors to The Dexter Corporation, Windsor Locks, Conn.

Filed Feb. 25, 1992, Ser. No. 841,390
Int. Cl.[5] B32B *5/06*
U.S. Cl. 428—284 **20 Claims**

1. A process of producing a hydroentangled nonwoven fabric of enhanced cross direction properties comprising the steps of:

a) providing a bonded, continuous man-made filament, nonwoven base web material;

b) cross-stretching said base web by at least 5 percent its original extent but less than the cross direction elongation of said material under ambient-temperature stretching conditions;

c) stabilizing the base web material in its cross-stretched condition and relaxing the stabilized base web material to provide a prestretched web substantially free of cross direction tension;

d) applying a layer of fluid dispersible fibers to one surface of the relaxed prestretched web to form a multi-layer structure; and

e) subjecting said multi-layer structure to hydroentanglement while in its relaxed condition to affix the fibers to said one surface of the prestretched base web material.

5,151,321

METHOD OF MAKING CONDUCTIVE, WATER AND/OR ALCOHOL REPELLENT NONWOVEN FABRIC AND RESULTING PRODUCT

William G. Reeves, Woodstock; Michael D. Powers, Dunwoody; Michael P. Mathis, Marietta, and Leonard E. Duello, Woodstock, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 645,377, Aug. 29, 1984, abandoned. This application Mar. 2, 1987, Ser. No. 20,284
Int. Cl.[5] B32B *5/26, 27/02, 27/32, 33/00*
U.S. Cl. 428—286 **13 Claims**

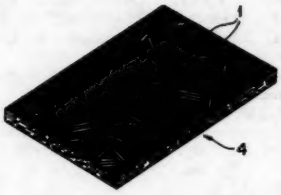
7. A nonwoven fabric comprising polypropylene-containing thermoplastic fibers or filaments and having a substantially continuous coating containing a polymer molecule having a combination of functional moieties and moieties having high affinity of polypropylene wherein the high affinity moieties are oriented towards and molecularly attached to the polypropylene fiber or filament surface of said fabric and said functional moieties are oriented outward forming the substantially continuous coating and imparting a desired alcohol and/or water repellent and/or electrical conductivity functional property to the nonwoven fabric.

5,151,322

THERMOPLASTIC COMPOSITE PLATE MATERIAL AND PRODUCTS MOLDED FROM THE SAME

Yukitane Kimoto, Otsu; Kohzou Murata, Nagoya, and Toshio Muraki, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 22, 1989, Ser. No. 440,367
Claims priority, application Japan, Nov. 24, 1988, 63-296996
Int. Cl.[5] B32B *7/00, 9/04, 27/14*
U.S. Cl. 428—303 **10 Claims**



1. A thermoplastic composite plate material having a quasi isotropy, wherein the mechanical properties of the plate material in any two directions perpendicular to each other and in a direction having an angle of 45° to the two perpendicular directions are each in the range of ±10%, the plate material comprising:

a thermoplastic polyether-imide resin having a melt viscosity of 1,000–15,000 poise at the temperature at which said composite plate material is formed; and

strip pieces each constructed of unidirectionally oriented reinforcing fibers selected from the group consisting of carbon fibers, glass fibers and polyaramid fibers, said strip pieces being randomly distributed in a plane parallel to a surface of said composite plate material, each of said strip pieces having the following dimensions:

(a) a thickness not greater than 0.1 mm,

(b) a width in the direction perpendicular to the reinforcing fibers' orientated direction of from 5 to 20 mm,

(c) a length in the reinforcing fibers' orientated direction of from 5 to 30 mm, and

(d) a ratio of said width of said length of from 0.2 to 1.0;

the composite plate material having a thickness of from 2 to 10 mm and a content of said reinforcing fibers therein of from 30 to 50% v/v.

5,151,323

MAGNETIC RECORDING MEDIUM AND MANUFACTURING METHOD THEREOF

Setsuko Kawahara; Yasushi Nakano, and Noboru Koyama, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Sep. 28, 1990, Ser. No. 588,689
Claims priority, application Japan, Sep. 29, 1989, 1-256473
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—323 **18 Claims**

1. A magnetic recording medium comprising

a support,

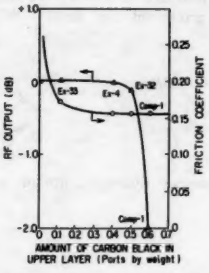
a plurality of magnetic layers being provided on a surface of said support,

a backcoat layer being provided on the other surface of said support and comprising a binder and a carbon black, wherein

an outermost magnetic layer being provided at the outermost portion from said support among said plurality of magnetic layers comprises a binder, a magnetic powder and a carbon black in which the weight ratio of said carbon black to said magnetic powder is 0.1 to 0.5:100,

a magnetic layer other than said outermost magnetic layer

comprises a binder, a magnetic powder different from said magnetic powder contained in said outermost magnetic



layer and a carbon black in which the weight ratio of said carbon black to said magnetic powder is zero to 0.4:100.

5,151,324

PATTERN COLORING MATERIAL FOR SYNTHETIC RESINS, METHOD FOR PRODUCING SAME AND SYNTHETIC RESIN MOLDED PRODUCTS USING SAME

Tadashi Hanatani, Takatsuki; Satoru Sanzen, Osaka, and Jichio Deguchi, Yokkaichi, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo and O.K.-Kasei Co., Ltd., Osaka, both of, Japan

Filed Oct. 9, 1990, Ser. No. 594,595

Claims priority, application Japan, Oct. 9, 1989, 1-263425; Jul. 13, 1990, 2-184157

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—323 **4 Claims**

1. A pattern coloring material for synthetic resins, comprising particulate matter of a cross-linked olefin polymer containing pigment, said cross-linked olefin polymer being a product obtained by cross-linking a vinylsilane-modified ethylene polymer or a vinylsilane-modified propylene polymer, said particulate matter being in the form of a powder, pellets or beads having a mean particle size of 1 to 10,000 μm.

5,151,325

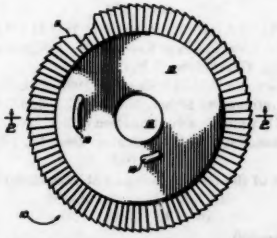
METHOD OF DYNAMICALLY BALANCING CERAMIC TURBINE WHEELS

Barry S. Draskovich, Mesa, Ariz., assignor to Allied-Signal Inc., Morris Township, N.J.

Division of Ser. No. 357,577, May 26, 1989, Pat. No. 5,047,264. This application Dec. 11, 1990, Ser. No. 625,509

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—325 **5 Claims**



1. In a gas turbine engine, a ceramic turbine wheel having thereon a glassy balancing pad formed from a cured mixture of a fine powder of said ceramic in a sodium silicate solution.

5,151,326

REUSABLE INK SHEET FOR USE IN HEAT TRANSFER RECORDING

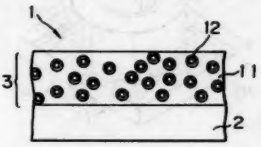
Genichi Matsuda, Kawasaki, and Takesi Sugii, Nagano, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 19, 1990, Ser. No. 495,560

Claims priority, application Japan, Mar. 20, 1989, 1-068647

Int. Cl.[5] B41M *5/26*

U.S. Cl. 128—336 **16 Claims**



1. A reusable, heat transfer recording ink sheet which comprises a substrate and an ink layer applied to one surface of the substrate, the ink layer comprising:

at least one colorant selected from dyes and pigments;

a low-melting compound as a vehicle; and powders coated with ethylene/vinyl acetate copolymer, the powders having a particle size of 0.01 to 200 μm and being dispersed in a mixture of the colorant and the low-melting compound, the powders being transferred to an ink receiving recording medium together with the mixture in each heat transfer recording, and the ethyelene/vinyl acetate copolymer having a number average molecular weight of 30,000 or less and containing vinyl acetate units in an amount of 18 to 45% by weight of the copolymer.

5,151,327

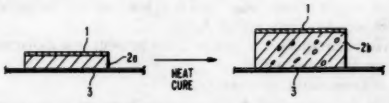
ADHESIVE SHEET FOR REINFORCING THIN RIGID PLATES

Yukio Nishiyama, and Kazuo Shigeta, both of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Mar. 15, 1990, Ser. No. 493,641

Int. Cl.[5] B32B *7/12, 3/26*

U.S. Cl. 428—343 **13 Claims**



1. An adhesive sheet for reinforcing thin rigid plates consisting essentially of:

(a) a thermosetting resin composition layer, tacky at room temperature, comprising a thermosetting resin, a hardener, and a foaming agent that decomposes to produce foam; and,

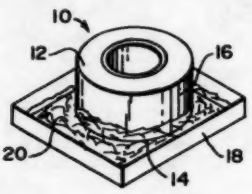
(b) a reinforcing substrate laminated or embedded with said thermosetting resin composition layer, said reinforcing substrate being treated with a heat-resistant resin to increase stiffness and maintain the uniformity of the thermosetting resin layer following foaming, and wherein the amount of said heat-resistant resin is from 2 to 20% by weight based on the amount of the reinforcing substrate before treatment.

5,151,328

MOISTURE-ACTIVATED ADHESIVE-BACKED TAPE

Peter N. Gold, 465 N. Wood Rd., Rockville Centre, N.Y. 11570

Filed Sep. 6, 1991, Ser. No. 755,870
Int. Cl.[5] B32B *7/12, 7/14;* B05D *1/18*
U.S. Cl. 428—351 2 Claims



1. A moisture-activated adhesive-backed tape comprising:

a roll of tape with a top side and underside and two edges, including a layer of moisture activated adhesive applied to the underside of the tape, and motor oil absorbed into both edges to provide flexibility, waterproofing, and a vapor barrier to prevent activation of said adhesive when the tape is rolled up.

5,151,329

PROCESS FOR THE PRODUCTION OF PATENT LEATHER AND PATENT LEATHER PREPARED THEREFROM

Klaus Noll; Josef Pedain; Bruno Zorn, all of Koeln, and Rosemarie Schmid, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 26, 1989, Ser. No. 371,357
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1988, 3823048
Int. Cl.[5] B32B *9/02, 27/40*
U.S. Cl. 428—423.4 16 Claims

9. A high gloss patent leather which is prepared by a process which comprises applying to a leather substrate a reactive mixture of a polyisocyanate with a hydroxyl group-containing oligourethane which comprises the reaction product of

A) 1) at least one macrodiol having an average molecular weight of 254 to 650 and comprising a member selected from the group consisting of an aromatic ring, a saturated cycloaliphatic ring and an unsaturated cycloaliphatic ring and

2) at least one macrodiol having an average molecular weight of about 1,200 to 3,000, provided that the molecular weight of macrodiol A/2 is at least 3 times the molecular weight of macrodiol A/1,

wherein macrodiols A/1 and A/2 are present in a molar ratio of about 1:6 to 6:1 with

B) at least one diisocyanate,

wherein the macrodiol A:diisocyanate B molar ratio is about 1.0:0.9 to 1.0:0.3.

5,151,330

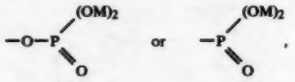
MAGNETIC RECORDING MEDIUM COMPRISING MAGNETIC PARTICLES AND A POLYURETHANE RESIN BINDER HAVING A POLYCAPROLACTONE STRUCTURAL UNIT

Kenji Kumamoto, and Kunitsuna Sasaki, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 614,009
Claims priority, application Japan, Nov. 17, 1989, 1-298963
Int. Cl.[5] G11B *5/00*
U.S. Cl. 428—425.9 7 Claims

1. A magnetic recording medium comprising a support and provided thereon a maqnetic layer containinq a maqnetic powder and a binder,

wherein the binder comprises a polyurethane resin having a polycaprolactone structural unit and a vinyl chloride resin having one group selected from —SO_3M, —COOM, —OSO_3M,



wherein M represents hydrogen, lithium, sodium or potassium.

5,151,331

SOLVENT BLOCKERS AND MULTILAYER BARRIER COATINGS FOR THIN FILMS

Charles L. Beeson, Hopewell; Raymond T. Cole, Midlothian, both of Va.; Gedeon I. Deak, Wilmington, Del., and Harbeson H. Leidolf, Jr., Richmond, Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 565,124, Aug. 10, 1990, Pat. No. 5,102,699. This application Feb. 5, 1992, Ser. No. 831,702
Int. Cl.[5] B32B *27/08;* B65D *85/72*
U.S. Cl. 428—475.5 13 Claims

1. A coated film prepared by the following process:

(a) applying a coating of solvent-borne polymeric composition to at least one surface of said film;

(b) removing substantially all of the solvent from said at least one coating;

(c) thereafter applying to the coated surface of said film a polymeric barrier layer;

(d) applying to said polymeric barrier layer a subsequent coating of solvent-borne polymeric composition, carried in a solvent to which said polymeric barrier layer is substantially impermeable; and

(e) removing the solvent from the subsequent coating;

whereby the solvent carrying said subsequent coating does not permeate the underlying coating.

5,151,332

ALUMINUM SHEETS BONDED WITH CADMIUM

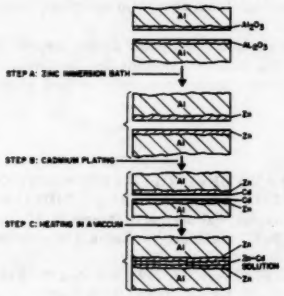
Charles E. De Clerck, Great River, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Division of Ser. No. 423,513, Dec. 18, 1989, Pat. No. 5,044,546, which is a continuation of Ser. No. 147,021, Jan. 19, 1988, Pat. No. 4,948,031, which is a continuation of Ser. No. 928,425, Nov. 10, 1986, abandoned. This application Dec. 13, 1990, Ser. No. 627,005
The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.
Int. Cl.[5] B32B *15/20*
U.S. Cl. 428—650 2 Claims

1. An article of manufacture comprising:

a first aluminum member having a bonded surface comprising a first layer of zinc;

a second aluminum member having a bonded surface comprising a second layer of zinc; and



an interlayer comprising a solution of cadmium and zinc disposed between said first and second layers, and forming a bond between said first and second layers.

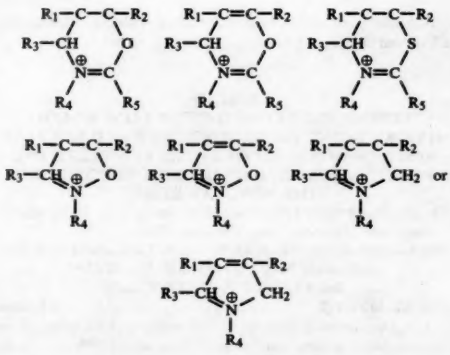
5,151,333

MAGNETIC RECORDING MEDIUM COMPRISING A MAGNETIC LAYER OR BACKCOAT LAYER CONTAINING A SPECIFIED DISPERSANT

Shizuo Kitahara; Eitaro Nakamura, and Yoichiro Kubo, all of Kawasaki, Japan, assignors to Nippon Zeon Co., Ltd, Tokyo, Japan

Filed Aug. 6, 1990, Ser. No. 562,993
Claims priority, application Japan, Aug. 7, 1989, 1-204374
Int. Cl.[5] G11B *5/00*
U.S. Cl. 428—694 **10 Claims**

1. A magnetic recording medium which comprises a nonmagnetic support and, formed thereon, a magnetic layer comprising a ferromagnetic powder and a binder, wherein the magnetic layer contains at least 0.1 part by weight, per 100 parts by weight of the ferromagnetic powder, of a dispersant compound or polymer having at least one $>C{=}N^{\oplus}<$ bond in the molecule of the formula



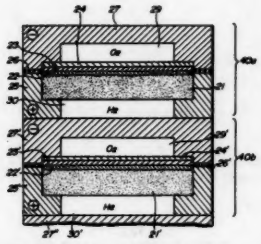
wherein R_1 and R_2 in the compound represent a hydrogen atom or a hydrocarbon group having not more than 6 carbon atoms, and in the polymer are hydrocarbon groups taken together to form the main chain of the polymer; R_3, R_4 and R_5 may be the same or different and each represents a hydrocarbon group optionally substituted by a halogen atom, a nitro group, an epoxy group, a carboxyl group or a hydroxyether group.

5,151,334

FUEL CELL UTILIZING SOLIDOUS ELECTROLYTE

Kazuo Fushimi, Saitama; Kaoru Kitakizaki, Kanagawa, and Kazuhiko Kawakami, Tokyo, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Aug. 24, 1990, Ser. No. 573,245
Claims priority, application Japan, Aug. 24, 1989, 1-217777; Aug. 24, 1989, 1-217780
Int. Cl.[5] H01M *8/10, 4/86*
U.S. Cl. 429—32 **13 Claims**



3. A fuel cell constructed of a plurality of cell unit structures stacked and connected in series, wherein said cell unit structure comprises;

a porous substrate,

a hydrogen electrode film stacked on said porous substrate, said film formed of a mixture of a first nickel powder having diameter of less than or equal to 1 μm and a second nickel powder having diameter of less than or equal to 3 μm, for forming fine voids of homogeneous diameter,

a coating of platinum stacked on said hydrogen electrode film,

a solid electrolyte film stacked on said platinum coating, and

an oxygen electrode film stacked on said solid electrolyte film.

5,151,335

CATHODE MATERIAL FOR ELECTROCHEMICAL CELLS

David M. Ryan, Beavercreek, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 29, 1991, Ser. No. 834,731
Int. Cl.[5] H01M *4/24, 6/14*
U.S. Cl. 429—223 **13 Claims**

1. A primary cell having an anode material, an electrolyte material and a cathode material wherein said cathode material, in the pre-discharge condition thereof, is $K_7(NiV_{13}O_{30})$.

5,151,336

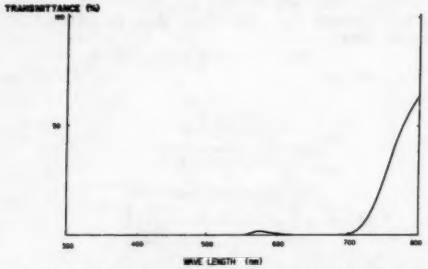
MASKING MATERIAL

Toshie Yokosuka, Yono, Japan, assignor to Kimoto Co., Ltd., Japan

Filed Sep. 10, 1990, Ser. No. 579,973
Claims priority, application Japan, Sep. 14, 1989, 1-238557
Int. Cl.[5] G03F *9/00*
U.S. Cl. 430—7 **4 Claims**

1. A masking material for masking a photosensitive color element having three light-sensitive layers for developing cyan, magenta and yellow, respectively, said masking material comprising a layer containing a colorant and blocking trans-

mission of light in those areas of the visible spectrum to which said photosensitive color element is sensitive, while transmitting light within the range of 560–660 nm with a transmission density sufficiently high to avoid fogging of the color element.



5,151,337

METHOD OF ELECTROPHOTOGRAPHICALLY MANUFACTURING A LUMINESCENT SCREEN FOR A COLOR CRT HAVING A CONDUCTIVE CONTACT PATCH

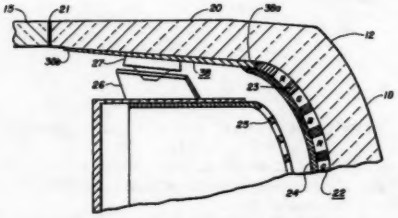
Charles M. Wetzel, Lititz; Peter M. Ritt, East Petersburg; Owen H. Roberts, Jr., Landisville, and Harry R. Stork, Adamstown, all of Pa., assignors to RCA Thomson Licensing Corp., Princeton, N.J.

Filed Jun. 26, 1990, Ser. No. 543,309

The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.

Int. Cl.[5] G03C *5/00*

U.S. Cl. 430—28 **12 Claims**



1. In a method of electrophotographically manufacturing a luminescent screen on a substrate of a color CRT comprising the steps of:

a) forming a photoreceptor by coating a surface of said substrate with a first solution to form a volatilizable conductive layer and overcoating said conductive layer with a second solution to form a volatilizable photoconductive layer;

b) establishing a substantially uniform electrostatic charge on said photoconductive layer;

c) exposing selected areas of said photoconductive layer to visible light to affect the charge thereon;

d) developing selected areas of said photoconductive layer with a triboelectrically charged, dry-powdered, first screen structure material; and

e) sequentially repeating steps b, c and d for triboelectrically charged, dry-powdered, color-emitting phosphor screen structure materials to form said luminescent screen comprising picture elements of color-emitting phosphor materials;

wherein the improvement comprises providing at least one wear-resistant conductive contact patch on a peripheral portion of said surface of said substrate, said contact patch having a first portion underlying at least one of said layers of said photoreceptor and in electrical contact therewith and a second portion extending therefrom;

grounding said contact patch during step b) to facilitate the establishing of said charge on said photoconductive layer; and

contacting said contact patch during step d) with suitable measuring means to monitor the deposition of said triboelectrically charged materials on said photoconductive layer.

5,151,338

TONER AND DEVELOPER COMPOSITIONS WITH CHARGE ENHANCING ADDITIVES

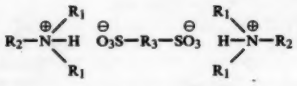
Robert D. Bayley, Fairport, and Thomas R. Hoffend, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1991, Ser. No. 797,633

Int. Cl.[5] G03G *9/09, 9/097*

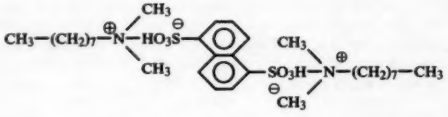
U.S. Cl. 430—106 **39 Claims**

1. A toner composition comprised of resin particles, pigment particles, and a charge enhancing additive as represented by the following formula



wherein R_1, R_2, and R_3 are independently selected from the group consisting of alkyl and aryl.

2. A toner composition comprised of resin particles, pigment particles, and a charge enhancing additive 1,5-di(octyldimethylammonium)naphthalenedisulfonate as represented by the following formula



3. A toner compositions in accordance with claim 1 wherein alkyl contains from 1 to about 25 carbon atoms.

5,151,339

PHOTORESIST COMPOSITION CONTAINING DIAZOQUINONE PHOTOSENSITIZER AND NOVALAK RESIN CHARACTERIZED BY THE COMPLETE AND SELECTIVE REMOVAL OF DIMERIC SPECIES FROM THE NOVOLAK RESIN

Thomas R. Sarubbi, Providence, R.I., assignor to OCG Microelectronic Materials, Inc., Cheshire, Conn.

Continuation of Ser. No. 404,829, Sep. 8, 1989, abandoned. This application May 15, 1991, Ser. No. 702,155

Int. Cl.[5] G03F *7/023;* **G03C** *1/60*

U.S. Cl. 430—192 **5 Claims**

1. A photoresist composition comprising an admixture of, on a solvent-free weight basis, about 50% to about 95% by weight of an alkali-soluble novolak resin and about 5% to about 50% by weight of a diazoquinone photo-sensitizer, said novolak resin being characterized by the complete and selective removal of phenolic dimers therefrom without cross-linking or chemically altering the other constituents of said novolak resin, and said photoresist composition being characterized as producing scum-free image areas after exposure to actinic radiation and development with an alkaline developer solvent and said complete and selective removal of said phenolic di-

mers from said novolak resin being made by a process comprising the steps of:

(a) providing an impure novolak resin composition containing at least a minor amount by weight of one or more phenolic dimers;

(b) adding a capping agent to said impure novolak resin in an amount which provides at least one capping group for reaction with each phenolic hydroxy group present in said impure novolak resin under conditions which cause said capping agent to react with and cap each said phenolic hydroxy group of said novolak resin, rendering said novolak resin more heat-stable, and which convert said phenolic dimers to capped phenolic dimers which have a lower distillation temperature than the said dimers in uncapped form;

(c) subjecting the capped novolak resin to distillation conditions to effect selective evaporation and removal of the capped phenolic dimers;

(d) removing the capping group from remaining capped novolak resin thereby restoring the hydroxy groups originally present in said novolak resin; and

(e) isolating said novolak resin which has been purified of said phenolic dimers.

5,151,340

SELECTED PHOTOACTIVE METHYLOLATED CYCLOHEXANOL COMPOUNDS AND THEIR USE IN RADIATION-SENSITIVE MIXTURES

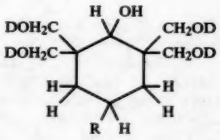
Sobhy Tadros, Seekonk, Mass., assignor to OCG Microelectronic Materials, Inc., Cheshire, Conn.

Filed Jul. 2, 1990, Ser. No. 546,988

Int. Cl.[5] G03F *7/022, 7/023, 7/32;* C07C *245/00*

U.S. Cl. 430—192 **13 Claims**

1. A photoactive compound having formula (I):



(I)

wherein R is selected from the group consisting of hydrogen or a lower alkyl group having 1–4 carbon atoms and each D is individually selected from the group of hydrogen or photoactive o-napthoquinonediazide sulfonyl group; subject to the proviso that at least two of the four D's in formula (I) are photoactive o-naphthoquinonediazide sulfonyl moieties.

5,151,341

RADIATION-SENSITIVE MIXTURE AND PRODUCTION OF RELIEF STRUCTURES

Son N. Kim, 9 Zedernweg, 6944 Hemsbach, Fed. Rep. of Germany

Filed Nov. 20, 1990, Ser. No. 615,866

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1989, 3940965

The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.

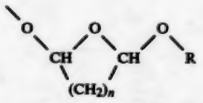
Int. Cl.[5] G03C *1/492*

U.S. Cl. 430—270 **11 Claims**

1. A negative-working radiation-sensitive mixture consisting essentially of

(a) a water-insoluble binder or binder mixture which is soluble in aqueous alkali and

(b) a compound which forms a strong acid on irradiation, wherein component (a) contains at least one group (I)



(I)

where R is alkyl of 1 to 5 carbon atoms and n is 2, 3 or 4.

5,151,342

MULTILAYER RECORDING MEDIUM FOR OPTICAL INFORMATION

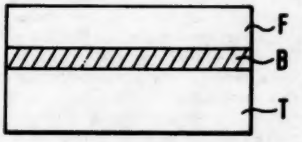
Wolfgang Wiedemann, Geisenheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 299,346

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 3802031

Int. Cl.[5] G03C *1/735, 1/76*

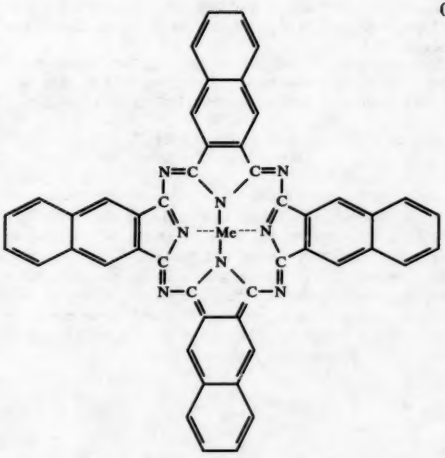
U.S. Cl. 430—271 **22 Claims**



1. A multilayer recording medium for optical information, which can be used for a single recording operation, comprising:

a support;

a layer having a thickness ranging from 30 to 200 nm, comprising an unsubstituted naphthalocyanine dye of the formula I;



(I)

wherein

Me either denotes two hydrogen atoms or a metal selected from the group consisting of Cu, Zn, Al, Ga, In, Si, G, Sn, Pb, Mg, Ti, V, Cr, Mn, Fe, Co, Ni and Pd; and a binder layer having a thickness in the range

from 30 to 300 nm positioned between the support and the naphthalocyanine-dye layer, wherein the binder comprises a

thermoplastic material having a low softening temperature, as compared with the dye.

5,151,343

PHOTOGRAPHIC MATERIAL AND PROCESS COMPRISING WASH-OUT NAPHTHOLIC COUPLER

William J. Begley, Webster; Teh-hsuan Chen, Fairport; Hans G. Ling, Rochester; John W. Harder, Rochester, and Arlyce T. Bowne, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 733,554, Jul. 22, 1991, which is a continuation of Ser. No. 483,601, Feb. 22, 1990, abandoned. This application Aug. 22, 1991, Ser. No. 748,499

Int. Cl.[5] G03C *7/34*

U.S. Cl. 430—382 **8 Claims**

1. A photographic element comprising a support bearing at least one photographic silver halide emulsion layer and an immobile naphtholic coupler capable upon oxidative coupling of forming a dye that is capable of being washed out of the photographic element upon photographic processing, wherein the immobile naphtholic coupler comprises a ballast-free naphtholic coupler moiety comprising a $—CONH_2$ group in the 2-position and in the 4-position a ballasted coupling-off group that comprises a releasable development inhibitor group.

6. A process of forming a photographic image which comprises developing an exposed photographic silver halide emulsion layer with a color developing agent in the presence of a naphtholic coupler as defined in claim 1.

5,151,344

METHOD FOR PROCESSING A SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Akira Abe; Keiji Mihayashi, and Seiji Ichijima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

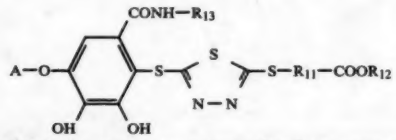
Continuation of Ser. No. 444,445, Nov. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 199,826, May 27, 1988, abandoned. This application Oct. 10, 1991, Ser. No. 774,741

Claims priority, application Japan, May 28, 1987, 62-133018

Int. Cl.[5] G03C *7/30*

U.S. Cl. 430—383 **8 Claims**

1. A method for processing a silver halide color photographic material comprising a support having thereon at least one of a light-sensitive silver halide emulsion layer and an adjacent layer thereof containing at least one compound represented by formula (V), wherein said silver halide color photographic material is subjected to a color-developing process with a color developing solution in which a replenisher is replenished in an amount of 700 ml or less per m^2 of the silver halide color photographic material:



(V)

wherein A represents a coupler residue; R_{11} represents a divalent aliphatic group having from 1 to 4 carbon atoms; and R_{12} and R_{13} each represents an aliphatic group having from 1 to 4 carbon atoms.

5,151,345

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Kazunori Hasebe, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 13, 1990, Ser. No. 611,639

Claims priority, application Japan, Nov. 14, 1989, 1-297218

Int. Cl.[5] G03C *1/80*

U.S. Cl. 430—525 **7 Claims**

1. A silver halide color photographic material which is subject to color development with a color developer, said material comprising a reflective support comprising a support base material coated with a waterproof resin layer, and at least one silver halide emulsion layer thereon, wherein at least one silver halide emulsion layer thereon comprises silver halide grains containing silver chloride in an amount of from 90 to 99.9 mol %., having a silver bromide-rich region near at least one apex of the silver halide grain, and having a mean bromide content at the surface of the grain of not more than 15 mol %, wherein the waterproof resin layer having the silver halide emulsion layer thereon contains titanium oxide in an amount of from 15 to 60% by weight; and further the optical reflection density of the photographic material at 680 nm is not lower than 0.70.

5,151,346

PROCESS FOR PREPARING A SILVER HALIDE EMULSION

Fumitaka Terai, Saitama; Hiroyuki Yamagami, Kanagawa; Nobuhiko Uchino, Kanagawa, and Masaki Okazaki, Kanagawa, all of Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

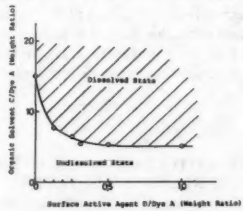
Continuation of Ser. No. 375,559, Jul. 5, 1989, Pat. No. 4,987,062. This application Oct. 31, 1990, Ser. No. 607,338

Claims priority, application Japan, Jul. 4, 1988, 63-164910; Jul. 4, 1988, 63-164911; Jul. 12, 1988, 63-171878

The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.

Int. Cl.[5] G03C *1/12, 1/38*

U.S. Cl. 430—546 **5 Claims**



1. A process for preparing a silver halide emulsion, comprising the steps of:

dissolving a surface active agent having a hydrophilic $—SO_3$ or $—OSO_3$ group in an alcohol, said alcohol being an aromatic primary alcohol or a halogenated alcohol, to make a solution of the surface active agent consisting essentially of the alcohol and the surface active agent;

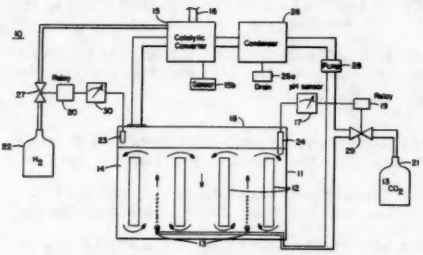
dissolving one or more substantially water-insoluble photographic additives in said solution of the surface active agent to make a solution of the surface active agent and the one or more substantially water-insoluble photographic additives, and then adding the resulting solution to a silver halide emulsion.

5,151,347

CLOSED PHOTOBIOREACTOR AND METHOD OF USE

Jacques J. Delente, Kensington; Paul W. Behrens, Ellicott City, and Scot D. Hoeksema, Elkridge, all of Md., assignors to Martek Corporation, Columbia, Md.

Filed Nov. 27, 1989, Ser. No. 441,553
Int. Cl.[5] C12N *1/12*; C12Q *3/00*; C12M *1/34*
U.S. Cl. 435—3 23 Claims



1. A closed photobioreactor comprising:

(a) container means for containing a photosynthetic algal culture in a substantially sealed environment;

(b) means for introducing light into said container means;

(c) means for introducing a reactant gas into said container means for photosynthetically reacting with a culture in said container means in the presence of light such that molecular oxygen is produced as a by-product, the molecular oxygen and unconsumed reactant gas forming a gas mixture;

(d) means for removing the molecular oxygen from the gas mixture without leaving by-products of the oxygen removal to be recirculated and without substantial leakage of the unconsumed reactant gas;

(e) means for recirculating the unconsumed reactant gas after oxygen removal through an algal culture in the substantially sealed environment when the reactant gas and the algal culture are present in said container means; and

wherein said means for removing molecular oxygen comprises means for enabling a combustion reaction with the oxygen and at least one other element to form a stable chemical compound thereof with said at least one other element.

17. A method of performing a continuous photosynthetic reaction process comprising:

(a) maintaining a photosynthetic algal culture in a substantially sealed environment;

(b) circulating a reactant gas through said culture in the presence of light and photosynthetically reacting said gas with said culture and thereby producing molecular oxygen in said reactant gas as a by-product, the molecular oxygen and unconsumed reactant gas forming a gas mixture;

(c) removing the molecular oxygen produced after photosynthetically reacting the reactant gas with said culture, from the gas mixture, said removing the molecular oxygen comprising enabling a combustion reaction with the molecular oxygen and at least one other element to form a stable chemical compound thereof with at least one other element, and without the stable chemical compound or other by-product of the chemical reaction being recirculated into said algal culture; and

(d) recirculating the unconsumed reactant gas after oxygen removal into said algal culture in said substantially sealed environment.

5,151,348

ENZYME-LINKED IMMUNOASSAY FOR MEASUREMENT OF CYCLOSPORIN A LEVELS IN WHOLE BLOOD SAMPLES

Hon-Peng P. Lau, Hockessin, Del., and Warren K. Miller, Lincoln University, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 23, 1988, Ser. No. 288,912
Int. Cl.[5] C12Q *1/00*; G01N *33/543*, *33/553*, *33/538*
U.S. Cl. 435—7.92 4 Claims

1. An enzyme-linked immunoassay for the measurement of cyclosporin A levels in whole blood samples comprising the steps of:

(a) lysing red blood cells in a sample of whole blood containing cyclosporin A;

(b) contacting the lysed whole blood sample with excess β-D-galactosidase-labeled anti-cyclosporin antibody to form a labeled antibody-cyclosporin A complex;

(c) separating unbound antibody from the complex by contacting the mixture formed in step (b) with a solid phase comprising cyclosporin immobilized on a solid support; and

(d) determining the amount the of β-D-galactosidase label in the complex as a measure of cyclosporin A by adding a β-D-galactosidase substrate selected from the group consisting of chlorophenol red-β-D-galactopyranoside and resorufin-β-D-galactopyranoside.

5,151,349

METHOD FOR EXPRESSING POLYPEPTIDE HAVING ANTI-TUMOR ACTIVITY

Shoji Tanaka; Masafumi Tsujimoto; Yayoi Wada; Nobuo Tsuruoka, and Hiroshi Nakazato, all of Osaka, Japan, assignors to Suntory Limited, Osaka, Japan

Division of Ser. No. 123,316, Nov. 20, 1987, Pat. No. 4,948,875.
This application Jan. 31, 1990, Ser. No. 473,168
Claims priority, application Japan, Dec. 4, 1986, 61-289514
Int. Cl.[5] C12P *21/02*
U.S. Cl. 435—69.1 5 Claims

1. A method of preparing a polypeptide having an anti-tumor activity, wherein said polypeptide is obtained by culturing a strain of *Escherichia coli* which has been transformed by a plasmid containing a DNA fragment in which a promotor region and a ribosome binding sequence, derived from *Escherichia coli* or phage genes, are operably linked with the upstream end of the DNA sequence coding for the following amino acid sequence:

X—ValArgSerSerSerArgThrProSerAsp
10
LysProValAlaHisValValAlaAsnPro
20
GlnAlaGluGlyGlnLeuGlnTrpLeuAsn
30
AsnThrAlaAsnAlaLeuLeuAlaAsnGly
40
ValGluLeuArgAspAsnGlnLeuValVal
50
ProSerGluGlyLeuTyrLeuIleTyrSer
60
GlnValLeuPheLysGlyGlnGlyCysPro
70
SerThrHisValLeuLeuThrHisThrIle
80
SerArgIleAlaValSerTyrGlnThrLys
90
ValAsnLeuLeuSerAlaIleLysSerPro
100
CysGlnArgGluThrProGluGlyAlaGlu
110
AlaLysProTrpTyrGluProIleTyrLeu
120
GlyGlyValPheGlnLeuGluLysGlyAsp
130

-continued

ArgLeuSerAlaGluIleAsnArgProAsp
140
TyrLeuAspPheAlaGluSerGlyGlnVal
150
TyrPheGlyIleIleAlaLeu—OH

wherein X is Met, if present, followed by extraction and purification of the polypeptide from the culture.

5,151,350

CLONED GENES ENCODING RECOMBINANT PROTEIN A

Donald A. Colbert, Bedford, and Algis Anilionis, Arlington, both of Mass., assignors to Repligen Corporation, Cambridge, Mass.

Filed Oct. 27, 1982, Ser. No. 436,955
Int. Cl.[5] C12P *21/02;* **C12N** *15/11, 15/31, 15/00*
U.S. Cl. 435—69.1 **45 Claims**

1. A microorganism comprising a recombinant plasmid containing a nucleotide sequence coding for the amino acid sequence of a protein A material having a protein A biological activity, and equivalent nucleotide sequences coding for molecules with substantially the same protein A-like biological activity, said nucleotide sequence and said amino acid sequence are as follows:

TTG AAA AAG AAA AAC ATT TAT TCA ATT CGT AAA
Met Lys Lys Lys Asn Ile Tyr Ser Ile Arg Lys

CTA GGT GTA GGT ATT GCA TCT GTA ACT TTA GGT
Leu Gly Val Gly Ile Ala Ser Val Thr Leu Gly

ACA TTA CTT ATA TCT GGT GGC GTA ACA CCT GCT
Thr Leu Leu Ile Ser Gly Gly Val Thr Pro Ala

GCA AAT GCT GCG CAA CAC GAT GAA GCT CAA CAA
Ala Asn Ala Ala Gln His Asp Glu Ala Gln Gln
—E→

AAT GCT TTT TAT CAA GTG TTA AAT ATG CCT AAC
Asn Ala Phe Tyr Gln Val Leu Asn Met Pro Asn

TTA AAC GCT GAT CAA CGT AAT GGT TTT ATC CAA
Leu Asn Ala Asp Gln Arg Asn Gly Phe Ile Gln

AGC CTT AAA GAT GAT CCA AGC CAA AGT GCT AAC
Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn

GTT TTA GGT GAA GCT CAA AAA CTT AAT GAC TCT
Val Leu Gly Glu Ala Gln Lys Leu Asn Asp Ser

CAA GCT CCA AAA GCT GAT GCG CAA CAA AAT AAG
Gln Ala Pro Lys Ala Asp Ala Gln Gln Asn Lys
←E— —D→

TTC AAC AAA GAT CAA CAA AGC GCC TTC TAT GAA
Phe Asn Lys Asp Gln Gln Ser Ala Phe Tyr Glu

ATC TTG AAC ATG CCT AAC TTA AAC GAG GAG CAA
Ile Leu Asn Met Pro Asn Leu Asn Glu Glu Gln

CGC AAT GGT TTC ATT CAA AGT CTT AAA GAC GAT
Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp

CCA AGC CAA AGC ACT AAC GTT TTA GGT GAA GCT
Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala

AAA AAA TTA AAC GAA TCT CAA GCA CCG AAA GCT
Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala
←D— —A→

GAC AAC AAT TTC AAC AAA GAA CAA CAA AAT GCT
Asp Asn Asn Phe Asn Lys Glu Gln Gln Asn Ala

-continued

TTC TAT GAA ATC TTG AAC ATG CCT AAC TTG AAC
Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn

GAA GAA CAA CGC AAT GGT TTC ATC CAA AGC TTA
Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu

AAA GAT GAC CCA AGT CAA AGT GCT AAC CTT TTA
Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu

GCA GAA GCT AAA AAG TTA AAT GAA TCT CAA GCA
Ala Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala

CCG AAA GCT GAT AAC AAA TTC AAC AAA GAA CAA
Pro Lys Ala Asp Asn Lys Phe Asn Lys Glu Gln
←A— —B→

CAA AAT GCT TTC TAT GAA ATC TTA CAT TTA CCT
Gln Asn Ala Phe Tyr Glu Ile Leu His Leu Pro

AAC TTA AAT GAA GAA CAA CGC AAT GGT TTC ATC
Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile

CAA AGC TTA AAA GAT GAC CCA AGC CAA AGC GCT
Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala

AAC CTT TTA GCA GAA GCT AAA AAG CTA AAT GAT
Asn Leu Leu Ala Glu Ala Lys Lys Leu Asn Asp

GCA CAA GCA CCA AAA GCT GAC AAC AAA TTC AAC
Ala Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn
←B— —C→

AAA GAA CAA CAA AAT GCT TTC TAT GAA ATT TTA
Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu

CAT TTA CCT AAC TTA ACT GAA GAA CAA CGT AAC
His Leu Pro Asn Leu Thr Glu Glu Gln Arg Asn

GGC TTC ATC CAA AGC CTT AAA GAC GAT CCT TCA
Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser

GTG AGC AAA GAA ATT TTA GCA GAA GCT AAA AAG
Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys

CTA AAC GAT GCT CAA GCA CCA AAA GAG GAA GAC
Leu Asn Asp Ala Gln Ala Pro Lys Glu Glu Asp
←C—

AAC AAC AAG CCT GGT AAA GAA GAC GGC AAC AAA
Asn Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys

CCT GGT AAA GAA GAC GGC AAC AAA CCT GGT AAA
Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys

GAA GAC AAC AAA AAC CTT GGC AAA GAA GAC GGC
Glu Asp Asn Lys Asn Leu Gly Lys Glu Asp Gly

AAC AAA CCT GGT AAA GAA GAC AAC AAA AAA CCT
Asn Lys Pro Gly Lys Glu Asp Asn Lys Lys Pro

GGC AAA GAA GAT GGC AAC AAA CCT GGT AAA GAA
Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu

GAC GGC AAC AAG CCT GGT AAA GAA GAT GGC AAC
Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn

AAA CCT GGT AAA GAA GAT GGC AAC AAG CCT GGT
Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly

AAA GAA GAT GGC AAC AAG CCT CGT AAA GAA GAC
Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp

GGC AAC GGA GTA CAT GTC GTT AAA CCT GGT GAT
Gly Asn Gly Val His Val Val Lys Pro Gly Asp

-continued

ACA GTA AAT GAC ATT GCA AAA GCA AAC GGC ACT
Thr Val Asn Asp Ile Ala Lys Ala Asn Gly Thr

ACT GCT GAC AAA ATT GCT GCA GAT AAC AAA TTA
Thr Ala Asp Lys Ile Ala Ala Asp Asn Lys Leu

GCT GAT AAA AAC ATG ATC AAA CCT GGT CAA GAA
Ala Asp Lys Asn Met Ile Lys Pro Gly Gln Glu

CTT GTT GTT GAT AAG AAG CAA CCA GCA AAC CAT
Leu Val Val Asp Lys Lys Gln Pro Ala Asn His

GCA GAT GCT AAC AAA GCT CAA GCA TTA CCA GAA
Ala Asp Ala Asn Lys Ala Gln Ala Leu Pro Glu

ACT GGT GAA GAA AAT CCA TTC ATC GGT ACA ACT
Thr Gly Glu Glu Asn Pro Leu Ile Gly Thr Thr

GTA TTT GGT GGA TTA TCA TTA GCG TTA GGT GCA
Val Phe Gly Gly Leu Ser Leu Ala Leu Gly Ala

GCG TTA TTA GCT GGA CGT CGT CGC GAA CTA TAA
Ala Leu Leu Ala Gly Arg Arg Arg Glu Leu Stop.

5,151,351

PROCESS FOR THE PRODUCTION OF 6-HYDROXYNICOTINIC ACID

Frans Hoeks, Naters, and Daniel Venetz, Brig, both of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Continuation of Ser. No. 629,673, Dec. 18, 1992. This application May 24, 1991, Ser. No. 705,659

Claims priority, application Switzerland, Dec. 20, 1989, 4555/89

Int. Cl.[5] C12P *17/12;* **C12R** *1/40, 1/025, 1/07*

U.S. Cl. 435—122 **4 Claims**

1. Process for the production of 6-hydroxynicotinic acid by microbiological hydroxylation of nicotinic acid under aerobic conditions, characterized in that nicotinic acid or a soluble salt of nicotinic acid or a solution containing nicotinic acid is added continuously or by portions to a starter culture of the microorganism, in that the microorganism is selected from the group consisting of *Achromobacter xylosoxydans* of strain DSM 2783, *Pseudomonas putida* of strain NCIB 10521 and *Pseudomonas putida* of strain NCIB 8176, and in that the nicotinic acid concentration in the culture during the period of addition is always greater than zero and at least remains substantially below the concentration, above which a growth inhibition of the microorganisms occurs, until the formed 6-hydroxynicotinic acid inhibits further growth, so that the multiplication of the microorganism and the formation of the 6-hydroxynicotinic acid take place in the same process step.

5,151,352

PROCESS FOR PRODUCING DITERPENE COMPOUNDS

Hirofumi Nakano, Tokyo; Shozo Kawada, Yamaguchi; Yoichi Uosaki; Yutaka Saito, both of Tokyo; Katsushige Gomi, and Toshiaki Iwazaki, both of Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

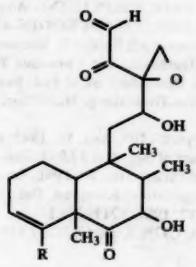
Filed Sep. 30, 1991, Ser. No. 767,819

Claims priority, application Japan, Oct. 5, 1990, 2-267840

Int. Cl.[5] C12P *17/02, 1/04;* **C12R** *1/465*

U.S. Cl. 435—123 **2 Claims**

1. A process for producing a clerodane-type diterpene derivative represented by formula (I):



(I)

wherein R represents a —CH_3 or —CH_2OH group; which process comprises culturing a microorganism belonging to the genus Streptomyces and capable of producing said clerodane diterpene derivative in a medium so as to accumulate said clerodane diterpene derivative in the culture and recovering the clerodane diterpene derivative from said culture.

5,151,353

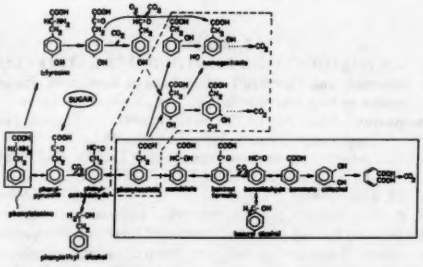
PROCESS OF USING BACTERIA THAT METABOLIZE PHENYLACETATE THROUGH MANDELATE

Steven D. Geusz, Silver Spring, and David M. Anderson, Rockville, both of Md., assignors to ChemGen Corporation, Gaithersburg, Md.

Division of Ser. No. 140,108, Dec. 31, 1987, Pat. No. 4,999,292. This application Mar. 11, 1991, Ser. No. 667,661

Int. Cl.[5] C12P *39/00, 7/24;* **C12N** *9/88;* **C12R** *1/40*

U.S. Cl. 435—147 **4 Claims**



1. A process for the production of natural benzaldehyde comprising the steps of:

obtaining benzoylformate by a fermentation employing bacteria that can metabolize phenylacetate through a mandelate intermediate and that cannot metabolize benzoylformate,

converting the benzoylformate into benzaldehyde via action of bacterial benzoylformate decarboxylase to effect an accumulation of benzaldehyde, and recovering said benzaldehyde.

5,151,354

FERMENTATION PROCESSES USING AMYLOLYTIC ENZYME PRODUCING MICROORGANISMS

Alexander Strasser, Dusseldorf; Feodor B. Martens, HE Leiden; Jurgen Dohmen, Meerbusbl, and Cornelius P. Hollenberg, Chopinstr 7, D-4000 Dusseldorf, all of Fed. Rep. of Germany, assignors to Cornelius Hollenberg, Dusseldorf, Fed. Rep. of Germany

Division of Ser. No. 85,107, Aug. 13, 1987, which is a continuation-in-part of Ser. No. 62,943, Jun. 16, 1987, abandoned. This application Aug. 21, 1991, Ser. No. 748,161

Claims priority, application European Pat. Off., Aug. 21, 1986, 86111586; Jul. 17, 1987, 87110370.1

Int. Cl.[5] C12P *7/06*; C12N *1/19*; C12C *11/00*; A21D *8/04*

U.S. Cl. 435—161 14 Claims

1. In a process for the production of ethanol, or of a fermented food or beverage, which comprises cultivating a Saccharomyces yeast culture in a suitable culture medium, the improvement comprising the use of a recombinant Saccharomyces yeast culture expressing a Schwanniomyces glucoamylase or alpha-amylase enzyme, said culture medium comprising fermentable material, at least a portion of which is fermentable by said Schwanniomyces enzyme but not by wild-type Saccharomyces amylolytic enzymes, under conditions favoring fermentation of said material.

5,151,355

PROCESS FOR THE PRODUCTION OF HIGH PURITY THROMBIN

Carmel Crowley, Dundrum; Timothy G. Sheehan, Ballincollig, and Frederick G. Ward, Kilpedder, all of Ireland, assignors to Warner Lambert Pottery Road Limited, Dun Laoghaire, Ireland

Filed Jan. 23, 1991, Ser. No. 644,800

Claims priority, application Ireland, Jan. 24, 1990, 266/90

Int. Cl.[5] C12N *9/74*; A61K *37/547*

U.S. Cl. 435—214 8 Claims

1. A process for the production of a liquid thrombin preparation, which process comprises reacting each unit of prothrombin measured as N.I.H. units of thrombin produced, with less than 5 units of thromboplastin, measured as N.I.H. units of thrombin produced, in the presence of calcium to produce thrombin contacting the resultant thrombin with a phosphate buffer to produce a suspension diluting and filtering the suspension to produce a filtrate applying the filtrate sequentially to an anion-exchange agarose column and a cation-exchange agarose column and step-wise eluting a thrombin fraction from the cation-exchange column with phosphate buffered saline.

5,151,356

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Kei Sakanoue, and Tsumoru Hirano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

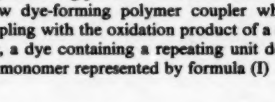
Continuation of Ser. No. 95,720, Sep. 14, 1987, abandoned. This application Mar. 8, 1990, Ser. No. 492,375

Claims priority, application Japan, Sep. 12, 1986, 61-215255

Int. Cl.[5] G03C *7/36*, *7/26*

U.S. Cl. 430—548 15 Claims

1. A silver halide color photographic material dye comprising a support having provided thereon at least one water-soluble yellow dye-forming polymer coupler which produces, upon coupling with the oxidation product of a color developing agent, a dye containing a repeating unit derived from at least one monomer represented by formula (I)



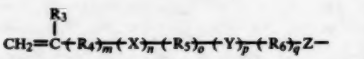
(I)

wherein

R_1 represents an alkyl group or an aryl group;

R_2 represents a monovalent group;

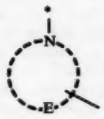
Q represents a group represented by formula (II)



(II)

wherein R_3 represents a hydrogen atom or an alkyl group; R_4, R_5, and R_6 each may be the same or different, and represents an alkylene group having from 1 to 20 carbon atoms, an arylene group having from 1 to 20 carbon atoms, or an aralkylene group having from 1 to 20 carbon atoms; X represents —CONH—, —NHCO—, —NHCONH—, —CCO—, —OCO—, $—SO_2—$, —S—, —CO—, —SO—, or —O—; Y represents —CONH—, —NHCO—, —NHCONH—, —COO—, —OCO—, $—SO_2NH—$, $—NHSO_2—$, or $—SO_2—$; m, n, o, p, and q each may be the same or different, and represent 0 or 1; and Z represents a coupling-off group represented by formula (III) or (IV)

(III)



(IV)

wherein * represents a position to be bound to the active site of said coupler; A represents an oxygen atom or a sulfur atom; B represents a non-metallic atomic group necessary for forming an aryl ring or a heterocyclic ring; and E represents a non-metallic atomic group necessary for forming a 5- or 6-membered heterocyclic ring together with the nitrogen atom; whereby said material is developable by a wet process.

5,151,357

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Tomoyuki Koide; Naoto Matsuda; Koki Nakamura, and Tetsuro Kojima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

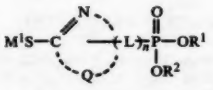
Filed Oct. 31, 1990, Ser. No. 606,279

Claims priority, application Japan, Nov. 1, 1989, 1-285154; Nov. 1, 1989, 1-285155

Int. Cl.[5] G03C *1/34*

U.S. Cl. 430—610 9 Claims

1. A heat-developable silver halide photographic material, comprising a light-sensitive emulsion layer or other hydrophilic colloid layer containing a compound represented by formula (I);



(I)

wherein Q represents a nonmetallic atomic group required to be connected to carbon atom and nitrogen atom to form a monocyclic or condensed heterocyclic ring therewith; L represents a divalent group selected from the group consisting of an alkylene group, an arylene group and a heteroarylene group, each of which may be substituted, and each of which may be alone or in combination with another divalent group

selected from the group consisting of an ether bond, thioether bond, urethane bond, urea bond, ester bond, amide bond, sulfonamide bond, thiourea bond and carboxylic ester bond; n represents an integer of 0 to 2; M^1 represents a hydrogen atom, ammonium ion or metallic ion; and R^1 and R^2 each represents a hydrogen atom, alkyl group, ammonium ion or metallic ion and may be the same or different or may be connected to each other to form a 5- or 6-membered ring.

5,151,358

PROCESSES FOR THE RECOVERY OF NATURALLY PRODUCED CHYMOSIN

Henry G. Heinsohn, Pacifica; Jeffrey D. Lorch; Kirk J. Hayenga, both of San Mateo, and Raymond E. Arnold, San Francisco, all of Calif., assignors to Genencor International, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 365,937, Jun. 13, 1989. This application Jun. 13, 1990, Ser. No. 537,461

Int. Cl.[5] C12N *9/64*

U.S. Cl. 435—226 **28 Claims**

1. A method for recovering and purifying chymosin from an aqueous solution which contains chymosin obtained from natural sources and which additionally contains pepsin and other contaminants which method comprises:

a) adding to the aqueous solution an effective amount of polyethylene glycol (PEG) and an inorganic salt so as to form a two phase system;

b) allowing the aqueous solution-polyethylene glycol-inorganic salt mixture to separate into a chymosin and pepsin-rich polyethylene glycol phase and a chymosin and pepsin-poor salt phase;

c) recovering the chymosin and pepsin-rich polyethylene glycol phase,

d) contacting the chymosin and pepsin-rich polyethylene glycol phase with an ion exchange resin under conditions wherein the chymosin binds to the resin and the polyethylene glycol and pepsin pass through the resin; and

e) recovering the chymosin from the resin.

5,151,359

METHOD FOR PRODUCING OF HUMAN TISSUE TYPE PLASMINOGEN ACTIVATOR

Shyoichiro Miyahara; Maki Suzuki, both of Yokohama; Atsunori Shindo, Kamakura; Nobumi Kusuhara, Yokohama, and Nobuyoshi Makiguchi, Fujisawa, all of Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Filed May 5, 1989, Ser. No. 347,649

Claims priority, application Japan, May 19, 1988, 63-122644; Dec. 16, 1988, 63-316118

Int. Cl.[5] C12N *9/64, 9/48, 9/72, 9/68*

U.S. Cl. 435—226 **6 Claims**

1. A method of producing predominantly single-chain human tissue type plasminogen activator with only minor amounts of double-chain human tissue type plasminogen activator, said method comprising culturing human tissue type plasminogen activator-producing cells in a cell culture medium supplemented with p-aminomethyl benzoic acid or a derivative thereof, so that the p-aminomethyl benzoic acid or its derivative directly inhibits the conversion of single-chain t-PA into double-chain t-PA, whereby t-PA is produced predominantly as single-chain t-PA in parallel with the growth of the cells.

5,151,360

EFFECT OF N,N,N-TRIMETHYLSPHINGOSINE ON PROTEIN KINASE-C ACTIVITY, MELANOMA CELL GROWTH IN VITRO, METASTATIC POTENTIAL IN VIVO AND HUMAN PLATELET AGGREGATION

Kazuko Handa; Yasuyuki Igarashi; Mahammad N. Ahmad, all of Seattle, and Sen-Itiroh Hakomori, Mercer Island, all of Wash., assignors to Biomembrane Institute, Seattle, Wash.

Continuation-in-part of Ser. No. 636,353, Dec. 31, 1990. This application Jul. 2, 1991, Ser. No. 724,625

Int. Cl.[5] C12N *5/00*

U.S. Cl. 435—240.2 **6 Claims**

1. A method of modulating intercellular contact comprising exposing cells to a biologically effective amount of N,N-dimethylsphingosine or N,N,N-trimethylsphingosine wherein said biologically effective amount is an amount that inhibits the expression or function of a cell adhesion molecule.

5,151,361

HOST CELLS EXPRESSING GIBBON APE LEUKEMIA VIRUS RECEPTOR

Bryan M. O'Hara, Pearl River, N.Y., assignor to American Cyanamid Company, Wayne, N.J.

Continuation of Ser. No. 398,351, Aug. 24, 1989, abandoned. This application Mar. 25, 1991, Ser. No. 675,129

Int. Cl.[5] C12N *5/06, 5/10; C07K 13/00*

U.S. Cl. 435—240.2 **2 Claims**

1. A non-human mammalian or yeast host cell expressing a human GALV receptor protein.

5,151,362

APPARATUS CONTAINING A SEPTUM WHICH IMPEDES CELL PERMEATION FOR CELL CULTURE AND METHOD OF USE

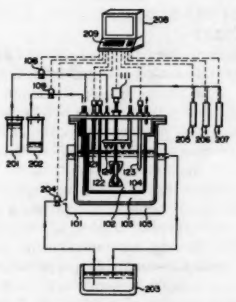
Hideo Kawaguchi, Hachioji; Kouji Takeuchi, Nagareyama; Tadashi Ishibashi, Kumagaya; Norio Shimizu, Sayama, and Yoji Odawara, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 5, 1990, Ser. No. 505,326

Claims priority, application Japan, Aug. 25, 1989, 1-217338

Int. Cl.[5] C12N *5/02; C12M 3/02, 1/12*

U.S. Cl. 435—240.25 **15 Claims**



1. A method of culturing cells suspended in a liquid medium comprising the steps of:

placing cells to be cultured which are suspended in the liquid medium in a first zone;

continuously supplying the liquid medium to said first zone;

providing a second zone which is separated from said first zone by a septum which has pores having the size that allows the cultured cells and the liquid medium to permeate therethrough from said first zone to said second zone, but resist against the cells passing freely therethrough;

continuously withdrawing from said second zone, the liquid medium that has passed through said pores of said septum

from said first zone to said second zone to proliferate cell growth in said first zone; and

controlling the flow rate of liquid medium supplied to said first zone to control the number of cells passing through said pores of said septum from said first zone in said second zone, so that the number of cells passing through from said first zone to said second zone does not exceed the number of cells increased by cell growth in said first zone.

5,151,363

ISOLATES OF *BACILLUS THURINGIENSIS* THAT ARE ACTIVE AGAINST NEMATODES

Jewel M. Payne, San Diego, Calif., assignor to Mycogen Corporation, San Diego, Calif.

Filed Jul. 27, 1990, Ser. No. 558,738
Int. Cl.[5] C12N *1/20*; A01N *63/00*
U.S. Cl. 435—252.5 **9 Claims**

1. A biologically pure culture selected from the group consisting of *Bacillus thuringiensis* strain PS80JJ1, having an accession number NRRL B-18679; *Bacillus thuringiensis* strain PS158D5, having an accession number NRRL B-18680; *Bacillus thuringiensis* strain PS167P, having an accession number NRRL B-18681; *Bacillus thuringiensis* strain PS169E, having an accession number NRRL B-18682; *Bacillus thuringiensis* strain PS177F1, having an accession number NRRL B-18683; *Bacillus thuringiensis* strain PS177G, having an accession number NRRL B-18684; *Bacillus thuringiensis* strain PS204G4, having an accession number NRRL B-18685; and *Bacillus thuringiensis* strain PS204G6, having an accession number NRRL B-18686.

5,151,364

EXPRESSION VECTORS CONTAINING LAMBDAPL PROMOTER, T_1T_2 RRNA TERMINATION SEQUENCE, AND ORIGIN OF REPLICATION DERIVED FROM A CONSTITUTIVE HIGH COPY NUMBER PLASMID, AND HOSTS CONTAINING THE PLASMIDS

Avigdor Levanon, Netanya; Amos B. Oppenheim, and Hilla Locker-Giladi, both of Jerusalem, all of Israel, assignors to Bio-Technology General Corp., New York, N.Y.

Continuation of Ser. No. 220,783, Jul. 18, 1988, Pat. No. 5,081,020, which is a continuation of Ser. No. 645,119, Aug. 27, 1984, abandoned. This application Jan. 14, 1992, Ser. No. 822,054
Int. Cl.[5] C12N *15/70, 15/73, 1/21*
U.S. Cl. 435—252.33 **14 Claims**

14. A host plasmid system for production of a bovine growth hormone polypeptide analog selected from the group of analogs consisting of an analog having the amino acids methionine, aspartic acid and glutamine attached to the N-terminus of the naturally-occurring polypeptide or the analog having the amino acid methionine attached to the N-terminus of the phenylalanine form of the naturally-occurring polypeptide, said analog having substantially the same biological activity as the naturally-occurring polypeptide, comprising a plasmid for the production of a polypeptide analog of animal growth hormone, the analog having substantially the same biological activity as the naturally-occurring polypeptide, which upon introduction into a suitable *Escherichia coli* host cell containing the thermolabile repressor cI renders the host cell capable, upon increasing the temperature of the *Escherichia coli* host cell to a temperature at which the repressor is inactivated, of effecting expression of DNA encoding the animal growth hormone polypeptide analog comprising:

a double-stranded DNA molecule which includes in the 5' to 3' order the following:

a DNA sequence which contains the promoter and operator $P_L O_L$ from lambda bacteriophage;

a Nut_L N utilization site;

a unique EcoRI restriction site;

a DNA sequence containing the mutant cII ribosomal binding site from lambda bacteriophage having the sequence:

TAAGGAAGTACTTACAT
ATTCCTTCATGAATGTA;

an ATG initiation codon;

DNA encoding the animal growth hormone polypeptide analog;

a DNA sequence which contains a T_1 T_2 rRNA transcription termination sequence;

and which additionally includes a DNA sequence which contains an origin of replication from the bacterial plasmid pOP 1Δ6 capable of autonomous replication in the host cell and production of 200–300 constitutive copies of the vector and either a DNA sequence which contains a gene associated with a selectable or identifiable phenotypic trait which is manifested when the plasmid is present in the host cell or a DNA sequence which contains the fragment designated cI^{434}, such fragment including the gene for the cI^{434} repressor protein and its associated promoter and operator sequence, the distance between the 3' end of the $P_L O_L$ promoter and operator sequence and the 5' end of the N utilization site being less than about 80 base pairs and the distance between the 3' end of the N utilization site and the 5' end of the ribosomal binding site being less than about 300 base pairs in a suitable *Escherichia coli* host.

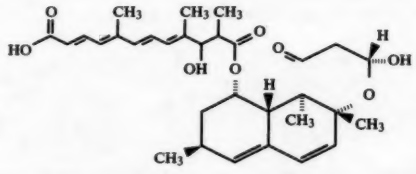
5,151,365

CULTURE OF *ASPERIGILLUS VERSICOLOR* AND MUTANTS THEREOF

Anne W. Dombrowski, East Brunswick, and Lawrence Koupal, Colonia, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 18, 1991, Ser. No. 670,639
Int. Cl.[5] C12R *1/66*; C12P *12/06*
U.S. Cl. 435—254 **1 Claim**

1. A biologically pure culture of *Aspergillus versicolor* MF2664 (ATCC 74035), or active mutants of *Aspergillus versicolor* MF2664 (ATCC 74035) having essentially the characteristics of *Aspergillus versicolor* MF2664 (ATCC 74035) that are capable of producing a compound of structure:



in recoverable amounts.

5,151,366

CELL CULTURE FLASK

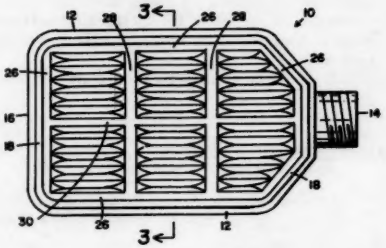
Jonathan M. Serkes, Oak View, and Richard C. St. Pierre, Thousand Oaks, both of Calif., assignors to Invitro Scientific Products, Inc., Ventura, Calif.

Filed May 24, 1991, Ser. No. 705,564
Int. Cl.[5] C12M *3/04, 1/24*
U.S. Cl. 435—285 **19 Claims**

1. In a stackable, generally rectangular, cell culture flask having a top wall and a bottom wall connected to side walls and end walls, one of said end walls including a neck and closure, the improvement comprising:

said bottom wall comprising an extended surface area and having an interior surface capable of attachment and confluent growth of animal cells, said bottom wall containing a plurality of parallel, non-horizontal folds and at

least one flat viewing panel disposed adjacent to said folds and said folds comprising a majority of the interior surface



of said bottom wall whereby the surface area for cell growth of said bottom wall is significantly increased.

5,151,367

DETECTOR FOR ENZYMATICALLY DETERMINING GAS SAMPLES

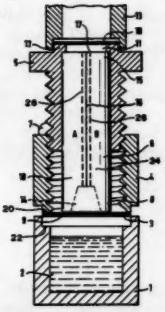
Klaus-Peter Rindt, and Stephan Scholtissek, both of Lübeck, Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Sep. 5, 1990, Ser. No. 577,540

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1989, 3929541

Int. Cl.[5] G01N *21/75*

U.S. Cl. 435—288 **23 Claims**



1. A detector for enzymatically determining a component in a gas or aerosol sample, the detector comprising:

an aqueous reagent solution;

a supply vessel defining an interior for holding said aqueous reagent solution;

a holder having a first opening;

a filler for receiving a reagent and an enzyme;

said enzyme being contained in at least one of said solution and said filler;

said filler being disposed in said holder so as to be in tight contact engagement therewith, said filler having an upper portion defining an upper end face and a lower portion extending outwardly from said first opening;

said holder having a second opening facing away from said first opening and communicating with said filler for permitting the component to be enzymatically detected to reach said upper end face of said upper portion;

water-impermeable and penetrable membrane means for closing off said supply vessel and said reagent solution until said detector is ready for use;

said membrane means being mounted between said lower portion of said filler and said supply vessel;

displacement means for facilitating an advance of said filler from a first position wherein said filler is outside of said interior and a second position wherein said filler is moved into said interior to permit only said lower portion of said filler to be dipped into said solution thereby permitting said upper end face to remain exposed to the component to be detected;

penetrating means for penetrating said membrane as said filler is advanced from said first position to said second position to allow said filler to enter said interior; and,

said filler being porous to facilitate the liquid transport of said solution into and along said filler thereby bringing the reagent and enzyme to said upper end face where the enzyme enters into a reaction with the component to be detected acting as a substrate to the enzyme, and to build up a compound which reacts with the reagent to generate a color indication at said end face indicative of the concentration of the component in the sample.

5,151,368

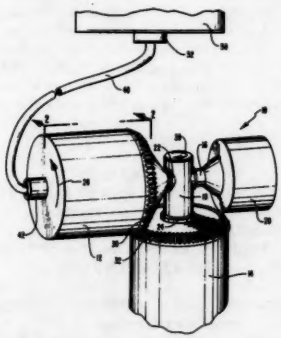
DUAL AXIS, CONTINUOUS FLOW BIOREACTOR APPARATUS

Owen D. Brimhall, South Jordan; Gail A. Bowers-Irons, and Joseph K. Weeks, Jr., both of Salt Lake City, all of Utah, assignors to Technical Research Associates, Inc., Salt Lake City, Utah

Filed Jan. 11, 1991, Ser. No. 639,966

Int. Cl.[5] C12M *1/10*

U.S. Cl. 435—312 **14 Claims**



1. A dual axis bioreactor system comprising:

a bioreactor vessel rotatably mounted on a horizontal axis with said horizontal axis being rotatably mounted to a rotatable vertical shaft so as to move said bioreactor vessel in a circular path about said vertical shaft while simultaneously rotating said bioreactor vessel about said horizontal axis;

interlock means between said horizontal axis and said vertical shaft so as to exactly limit one rotation of said bioreactor vessel about said horizontal axis for each traverse of said bioreactor vessel through said circular path about said vertical shaft;

conduit means for providing fluid communication with said bioreactor vessel, said conduit means comprising a flexible, multilumen conduit fixed to said bioreactor vessel at said horizontal axis of said bioreactor vessel and at a position opposite said vertical shaft; and

control means for limiting the rate of rotation of said vertical shaft to encourage internal mixing inside said bioreactor vessel, said internal mixing occurring preferentially over any centrifugal effects on said bioreactor vessel.

5,151,369

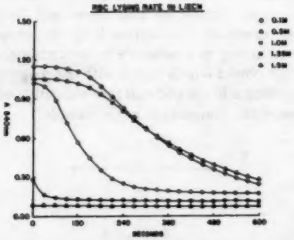
LITHIUM SALTS AS RED BLOOD CELL LYSING AND HEMOGLOBIN DENATURING REAGENTS

Lynette A. Lewis, Goshen, and M. Teresa Yip, Elkhart, both of Ind., assignors to Miles Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 379,582, Jul. 13, 1989, abandoned. This application May 14, 1990, Ser. No. 522,835

Int. Cl.[5] G01N *33/72, 33/50*

U.S. Cl. 436—67 **6 Claims**



1. In an analytical method for determining a particular hemoglobin derivative in a blood sample, wherein (a) the blood sample is treated with a lysing/denaturing reagent comprising (i) a salt form of an anion that is capable of lysing erythrocytes and denaturing said hemoglobin derivative and (ii) an oxidant capable of converting hemoglobin to the met-hemoglobin form, and (b) the resulting mixture is assayed by immunoassay for the amount of the denatured form of said hemoglobin derivative present therein,

the improvement which comprises employing a lithium salt form of said anion that is capable of lysing erythrocytes and denaturing said hemoglobin derivative, said lithium salt being present in said resulting mixture at a concentration of between about 1.0 and about 1.5 molar, whereby the erythrocyte lysis and denaturation of said hemoglobin derivative is accomplished in less than about one minute without interfering significantly with the immunoassay step.

5,151,370

REAGENT AND METHOD FOR SERUM IRON ASSAY

Jerry W. Denney, Lachine, Canada, assignor to Synermed, Inc., Quebec, Canada

Filed Oct. 11, 1990, Ser. No. 596,942

Int. Cl.[5] G01N *33/52*

U.S. Cl. 436—74 **14 Claims**

1. A method for the assay of iron in lipemic serum or heparinized plasma, comprising the steps of:

a. preparing a test sample by adding a first serum sample or heparinized plasma sample to the reagent comprising:

(1) a chromogen selected from the group consisting of chromazurol B, chromazurol S, and alkali metal, alkaline earth metal, rubidium, or ammonium salts thereof:

(2) a complexing surfactant selected from the group consisting of alkylammonium halides and polyhydroxyalkylene ethers;

(3) a buffer that will not complex iron and will provide a pH of from about 4.5 to about 5.5; and

(4) dimethylsulfoxide in an amount sufficient to solubilize the chromogen, eliminate protein interference in serum or heparinized plasma, and achieve an incubation time in the assay of from about 3 minutes to about 10 minutes;

b. preparing a test blank by ading iron-free water to said reagent;

c. preparing a test standard by adding an iron standard of known iron concentration to said reagent;

d. preparing a serum blank or heparinized plasma blank without masking reagent by adding a second serum sample or heparinized plasma sample to iron-free water;

e. incubating the test sample, the test blank, the test standard, and the serum blank or heparinized plasma blank without masking reagent at about 37° C. for at least about three minutes;

f. spectrophotometrically measuring absorbances (A) of the test sample, the rest blank, the test standard, and the serum blank or heparinized plasma blank without masking reagent; and

g. calculating the concentration of iron in the test sample by the equation

$$\frac{A_{test\ sample} - (A_{test\ blank} + A_{serum\ blank\ or\ plasma\ blank})}{A_{test\ standard} - A_{test\ blank}} \times$$

known concentration of iron in the test standard = concentration of iron in the test sample.

5,151,371

METHOD AND SCAVENGER GAS FOR THE ANALYSIS OF OXYGEN-CONTAINING COMPONENTS USING ATOMIC EMISSION SPECTROMETRY

Bruce D. Quimby, Landenberg, Pa., and James J. Sullivan, Newark, Del., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 64,041, Jun. 18, 1987, abandoned. This application Aug. 14, 1989, Ser. No. 394,316

Int. Cl.[5] G01N *21/73*

U.S. Cl. 436—127 **25 Claims**

1. In a method of an oxygen-containing compound in a sample comprising the steps of (i) introducing a mixture of the sample, an inert carrier gas therefor, and a reagent gas into an atomic emission spectrometer having plasma-excitation means, (ii) forming a plasma from said mixture, and (iii) detecting at least one oxygen-related optical emission generated thereby, wherein the improvement comprises introducing a controlled amount of a carbon-containing gas into said mixture prior to introducing said mixture into said spectrometer.

5,151,372

METHOD FOR DETERMINATION OF HYDROXYACETOPHENONE DERIVATIVES

Katsumasa Kuroiwa; Katsuhiro Katayama; Toshihide Miura, all of Koriyama, and Takeshi Nagasawa, Urawa, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

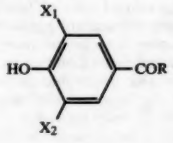
Filed Feb. 22, 1990, Ser. No. 483,903

Claims priority, application Japan, Mar. 8, 1989, 1-055696

Int. Cl.[5] G01N *21/00, 31/00, 33/00*

U.S. Cl. 436—164 **6 Claims**

1. A method for the determination of a hydroxyacetophenone derivative which comprises measuring a UV absorbance of said derivative, in association with a protein, said derivative represented by formula (I):



(I)

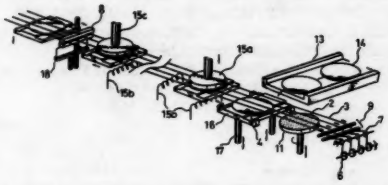
wherein R represents $-(CH_2)_nCH_3$ (n=0 to 3); and X_1 and X_2 independently represents a halogen atom or hydrogen atom.

5,151,373

METHOD OF MAKING A SOLAR CELL ELECTRODE

Mikio Deguchi; Takushi Itagaki, and Masaaki Usui, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 482,712, Feb. 21, 1990, Pat. No. 5,084,107. This application Sep. 23, 1991, Ser. No. 764,363
Claims priority, application Japan, Jun. 5, 1989, 1-142480
Int. Cl.[5] H01L *31/18*
U.S. Cl. 437—2 **4 Claims**



1. A method of making a solar cell electrode comprising:

applying an uncured electrically conductive adhesive to a portion of a metal wire by contacting the metal wire with a predetermined thickness of the adhesive spread on a substrate;

pressing the metal wire toward the light incident surface of the solar cell with the uncured electrically conductive adhesive between and contacting the metal wire and the light incident surface of the solar cell; and

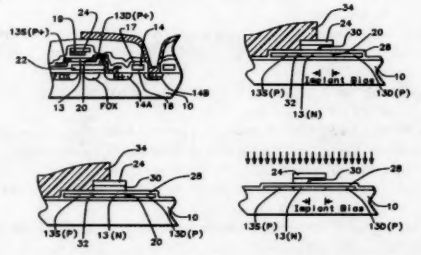
while pressing the metal wire toward the light incident surface, curing the conductive adhesive, thereby bonding the metal wire to the light incident surface of the solar cell.

5,151,374

METHOD OF FORMING A THIN FILM FIELD EFFECT TRANSISTOR HAVING A DRAIN CHANNEL JUNCTION THAT IS SPACED FROM THE GATE ELECTRODE

Neng-Wei Wu, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jul. 24, 1991, Ser. No. 735,086
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—40 **19 Claims**



1. A method of forming a thin film field effect transistor having a drain-channel P-N junction that is distanced from a gate electrode comprising:

depositing a first thin polycrystalline silicon layer doped with a first type impurity for semiconductors over a first thin insulating layer on a monocrystalline silicon substrate;

depositing a second thin insulating layer over the surface of said first polycrystalline silicon layer;

forming a second polycrystalline silicon layer over at least said second insulating layer; depositing a third insulating layer over said second polycrystalline silicon layer;

removing portions of said second polycrystalline silicon layer and overlying third insulating layer, leaving a gate area portion over a portion of the first polycrystalline silicon layer, the edges of the remaining portion of said second polycrystalline silicon layer being exposed;

introducing second opposite type impurity ions into said first polycrystalline layer by ion bombardment to form source and drain regions therein, the remaining gate electrode area portion of said second polycrystalline silicon layer and said third overlying insulating layer forming a mask thereby preventing ions from penetrating the underlying area of said first polysilicon layer to form a channel region positioned between said source and drain regions and defined by the drain channel P-N junction and the source channel P-N junction;

forming a masking layer that covers at least a portion of the edge of the second polycrystalline silicon layer over the source-channel P-N junction in said first polycrystalline silicon layer;

etching back the exposed edge portion of said second polycrystalline silicon layer above the drain-channel P-N junction in said first polycrystalline silicon 5 layer; and

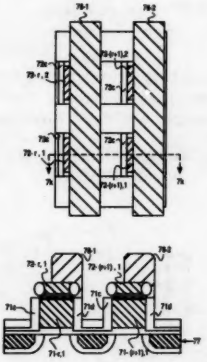
removing said masking layer and forming an overlying insulating layer over the surface of the resultant device.

5,151,375

EPROM VIRTUAL GROUND ARRAY

Reza Kazerounian, Alameda; Boaz Eitan, Sunnyvale, and Rustom F. Irani, Santa Clara, all of Calif., assignors to Waferscale Integration, Inc., Fremont, Calif.

Filed Jun. 13, 1990, Ser. No. 537,553
Int. Cl.[5] H01L *21/285, 21/76*
U.S. Cl. 437—43 **8 Claims**



7. The method of manufacturing a floating gate transistor in an array of such floating gate transistors comprising:

forming a gate oxide on a semiconductor substrate;

forming in a first direction on said gate oxide a plurality of strips of material, each strip comprising a conductive material covered by a selected dielectric covered by a conductive cap;

forming an insulating material on the sides of the conductive portions of said plurality of strips;

removing portions of the strips to form islands, each island comprising a conductive material covered by a selected dielectric covered by a conductive cap;

forming an insulating material on the conductive portions of the sides exposed by the removal of portions of the strips; and

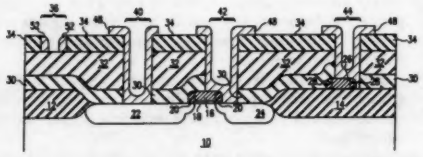
forming over the tops of said islands a multiplicity of conductive strips.

5,151,376

METHOD OF MAKING POLYCRYSTALLINE SILICON RESISTORS FOR INTEGRATED CIRCUITS

Charles R. Spinner, III, Dallas, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed May 31, 1990, Ser. No. 531,012
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—47 15 Claims



1. A method for fabricating a resistor structure between first and second laterally spaced regions in an integrated circuit device, comprising the steps of:

forming a first insulating layer over the device;

patterning the first insulating layer to define an elongate region between the first and second laterally spaced regions for formation of the resistor structure;

forming a second insulating layer over the device;

anisotropically etching the second insulating layer, leaving insulating sidewalls in the elongate region, wherein a narrowed region is defined;

depositing a layer of polycrystalline silicon over the device; and

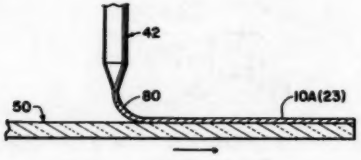
anistropically etching the polycrystalline silicon layer, wherein polycrystalline silicon remains in the narrowed region to form the resistor structure connecting the first and second laterally spaced regions.

5,151,377

METHOD FOR FORMING CONTACTS

Jack I. Hanoka, Brookline, and Scott E. Danielson, Stoneham, both of Mass., assignors to Mobil Solar Energy Corporation, Billerica, Mass.

Filed Mar. 7, 1991, Ser. No. 666,334
Int. Cl.[5] H01L *31/18*
U.S. Cl. 437—2 10 Claims



1. A method of forming a thick film in a predetermined circuit pattern on a substrate by depositing a viscous conductive ink thereon by means of a dispensing pen having a discharge orifice, said method comprising the following steps:

(a) disposing the pen so that its discharge orifice is directed downward;

(b) positioning a solar cell blank so that one surface thereof is located in a horizontal plane that is spaced from said discharge orifice by an amount exceeding the desired thickness of said thick film;

(c) dispensing a viscous conductive metal-containing ink onto said solar cell blank via said discharge orifice; and

(d) selectively providing relative movement between said solar cell blank and said pen in at least one horizontal direction so as to cause said ink to be deposited onto said solar cell blank as a thick film in a predetermined pattern;

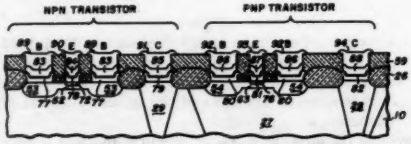
said pen being disposed at a fixed height above said solar cell blank as steps (c) and (d) are being performed, said fixed height being sufficiently in excess of the thickness of the ink deposited on said solar cell blank so that the discharge orifice of the pen does not ride on the deposited thick film.

5,151,378

SELF-ALIGNED PLANAR MONOLITHIC INTEGRATED CIRCUIT VERTICAL TRANSISTOR PROCESS

Amolak R. Ramde, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 716,890, Jun. 18, 1991. This application Mar. 31, 1992, Ser. No. 861,404
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—31 2 Claims



1. A process for simultaneously producing self-aligned NPN and PNP transistors, each one having a collector region, an emitter region, an extrinsic base region, an intrinsic base region and a link base region connecting said extrinsic and intrinsic base regions, said process comprising the steps:

starting with an epitaxially deposited N type semiconductor substrate wafer;

covering said substrate wafer surface with a relatively thin pad oxide;

applying an ion implant mask having openings that define where a PNP transistor will be located;

ion implanting aluminum at a dose that will provide a suitable PNP transistor collector resistivity;

applying an ion implant mask having openings that are located at the edge of said aluminum implant where a PNP transistor collector region sinker contact will be created;

ion implanting a relatively heavy dose of boron that will provide a suitable PNP transistor collector contact sinker;

applying an ion implant mask having openings that are located where an NPN transistor collector sinker contact is to be located;

ion implanting a relatively heavy dose of phosphorous that will provide a suitable NPN collector region sinker contact;

covering said substrate wafer with an oxidation resistant layer of silicon nitride;

applying an etch resist mask that covers said substrate wafer where said collector contact sinkers and the active regions of said transistors are to be located;

etching said silicon nitride away except where it is covered by said etch resist mask;

heating said substrate wafer in an oxidizing atmosphere to diffuse the previously ion implanted aluminum, boron and phosphorous into said substrate wafer and at the same time to grow a relatively thick field oxide on said substrate wafer except where it is covered with silicon nitride, thereby to create an aluminum doped P well surrounded by a field oxide, a boron doped PNP transistor collector sinker contact surrounded by a field oxide, a phosphorous doped NPN transistor collector region sinker contact surrounded by a field oxide and a region of epitaxial semiconductor where an NPN transistor will be located surrounded by a field oxide;

removing said silicon nitride in a selective etch thereby

exposing said pad oxide where the PNP and NPN transistors are to be created;

applying an etch-resist mask that covers said pad oxide in the regions where transistor link base regions are to be located;

etching away the thus exposed pad oxide to remove it and thereby expose the surface of said substrate wafer except in transistor link base regions;

covering said substrate wafer with a layer of undoped polysilicon;

applying an ion-implant mask having openings that span the PNP transistor extrinsic base and NPN transistor collector sinker regions;

ion implanting a relatively heavy dose of phosphorous into the exposed polysilicon so that it becomes heavily phosphorous doped;

applying an ion-implant mask having openings that span the NPN transistor extrinsic base and PNP transistor collector sinker regions;

ion implanting a relatively heavy dose of boron into the exposed polysilicon so that it becomes heavily boron doped;

applying an etch-resist mask contoured to cover the NPN and PNP transistor emitter regions, extrinsic base regions and collector sinker regions;

etching away the thus exposed polysilicon so as to leave undoped polysilicon emitter contacts, along with heavily doped polysilicon extrinsic base and collector sinker diffusion contacts;

heating said wafer to diffuse the phosphorous and boron in the polysilicon into said substrate wafer to create transistor extrinsic bases and collector sinker diffusion contact caps;

applying an ion implant mask having openings that span the PNP transistor locations;

ion implanting phosphorous to a dose that will provide the desired PNP transistor intrinsic base region resistivity;

applying an ion implant mask having openings that span the NPN transistor locations;

ion implanting boron to a dose that will provide the desired NPN transistor intrinsic base resistivity;

heating said substrate wafer atmosphere to diffuse the previously ion-implanted intrinsic base phosphorous and boron to the desired depth in the silicon wafer substrate;

applying an ion-implant mask having openings located over the NPN transistor emitter region and its collector sinker diffusion and the PNP transistor extrinsic base region;

ion implanting a very heavy dose of arsenic thereby to heavily dope the thus exposed polysilicon;

covering said substrate wafer with a layer of oxide film and heating said wafer in a phosphorous oxychloride to convert the surface of said oxide to a low temperature glass and to reflow said glass film and to diffuse said arsenic, previously applied, into said NPN transistor emitter and collector contact sinker diffusion regions and into said PNP transistor extrinsic base regions;

applying an ion-implant mask having openings located over said PNP transistor emitter and collector sinker diffusion regions and the NPN transistor extrinsic base region;

ion implanting a very heavy dose of boron into the thus exposed polysilicon thereby to heavily dope it with boron and

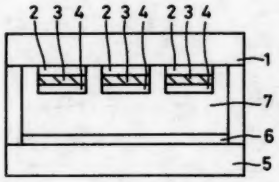
heating said substrate wafer to activate the previously applied boron to provide the PNP transistor emitter, collector sinker diffusion cap regions and the NPN transistor extrinsic base regions.

5,151,379

METHOD FOR MANUFACTURING A COLOR FILTER

Mitsuru Suginoya; Hitoshi Kamamori, and Takakazu Fukuchi, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Feb. 24, 1992, Ser. No. 840,336
Claims priority, application Japan, Feb. 26, 1991, 3-31071
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—39 **6 Claims**



1. A method for manufacturing a color filter comprising the steps of:

forming a color filter made of an organic polymer on a substrate; and

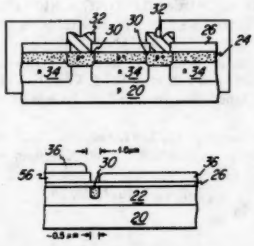
forming a transparent conductive film on the color filter by a high-frequency ion plating method, wherein the transparent conductive film is deposited from an evaporated material which is ionized by a high-frequency glow discharge and accelerated by a DC electric field in a low pressure chamber.

5,151,380

METHOD OF MAKING TOP BUSS VIRTUAL PHASE FRAME INTERLINE TRANSFER CCD IMAGE SENSOR

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 19, 1991, Ser. No. 747,036
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—53 **9 Claims**



1. A method for fabricating a virtual phase image sensor comprising the steps of:

forming a semiconductor substrate of a first conductivity type;

forming a buried channel region of a second conductivity type in said substrate;

forming a virtual gate of said first conductivity type at a surface of said buried channel region;

implanting at least one channel stop region of said first conductivity type in said virtual gate, said at least one channel stop region contacting said buried channel; and

forming at least one conductive contact on an upper surface of said at least one channel stop wherein said at least one conductive contact is additionally coupled to said substrate.

5,151,381

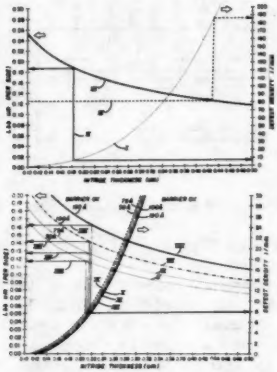
METHOD FOR LOCAL OXIDATION OF SILICON EMPLOYING TWO OXIDATION STEPS

Yowjuang B. Liu, San Jose; Steven W. Longcor, Mountain View, and Jih-Chang Lein, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 15, 1989, Ser. No. 437,023

Int. Cl.[5] H01C *21/76*

U.S. Cl. 437—69 20 Claims



1. A method of forming field oxide regions in a semiconductor substrate, comprising the steps of:

(a) providing a barrier oxide layer overlying the substrate;

(b) providing a non-oxidizable masking layer overlying portions of the barrier oxide layer corresponding to active regions;

(c) oxidizing the substrate in a dry oxygen environment at a temperature less than 1,050° C. after said step (b); and

(d) oxidizing the substrate in a dry oxygen environment including HCl at a temperature greater than 1,050° C. after said step (c).

5,151,382

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE BY MASKLESS PN JUNCTION ISOLATION MEANS

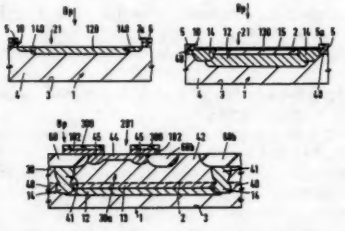
Wilhelmus J. M. J. Josquin, Eindhoven; Wilhelmus C. M. Peters, Nijmegen, and Albertus T. M. Van De Goor, Eindhoven, all of Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 17, 1991, Ser. No. 761,098

Claims priority, application United Kingdom, Sep. 19, 1990, 9020484

Int. Cl.[5] H01L *21/76*

U.S. Cl. 437—74 10 Claims



1. A method of manufacturing a semiconductor device, which method comprises providing a semiconductor body having a first region of one conductivity type adjacent one major surface, providing an insulating layer on the one major surface, using masking means to form windows in the insulating layer over first and second areas of the one major surface, introducing impurities to form a relatively highly doped region of the opposite conductivity type adjacent the first area and a relatively lowly doped region of the opposite conductivity type adjacent the second area, and introducing impurities of the one conductivity type for forming a region of the one conductivity type within the relatively lowly doped region of the opposite conductivity type, characterised by exposing the surface of the insulating layer prior to introducing the impurities of the one conductivity type and introducing the impurities of the one conductivity type through the windows in the insulating layer with a dose sufficient to form a region of the one conductivity type within the relatively lowly doped region of the opposite conductivity type but not within the relatively highly doped region of the opposite conductivity type, the thickness of the insulating layer being such that a proportion of the impurities of the one conductivity type penetrate the insulating layer to increase the doping of a surface layer of the first region adjacent the one major surface beneath the insulating layer.

5,151,383

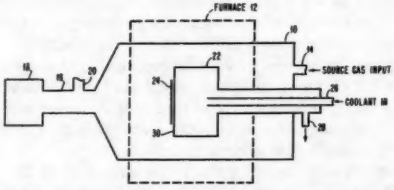
METHOD FOR PRODUCING HIGH ENERGY ELECTROLUMINESCENT DEVICES

Bernard S. Meyerson, Yorktown Heights; Bruce A. Scott, Pleasantville, and Donald J. Wolford, Jr., Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 921,985, Oct. 22, 1986, abandoned, which is a continuation of Ser. No. 567,303, Dec. 30, 1983, abandoned. This application Feb. 6, 1989, Ser. No. 307,154

Int. Cl.[5] H01L *21/20*

U.S. Cl. 437;101 13 Claims



1. A method for preparing a device emitting visible electroluminescence at room temperature when said device is electrically contacted and carriers are injected therein, said device being comprised of at least one layer of doped amorphous hydrogenated silicon (a-Si:H) on a substrate, and wherein said method includes the steps of:

depositing a layer of a-Si:H by thermally induced homogeneous CVD onto a substrate held at a temperature not exceeding about 200° C., said a-Si:H having a bandgap E_o, where E_o is between 1.6 and 2.6 eV, the amount of hydrogen in said a-Si:H layer being in the range 12–50 atomic percent,

doping said a-Si:H layer in-situ while it is being deposited onto said substrate to a doping level at least about 10^{16} carriers/cm^3, and

electrically contacting said device.

5,151,384

AMORPHOUS SILICON SWITCH WITH FORMING CURRENT CONTROLLED BY CONTACT REGION

David M. Williams, Oxon, England, assignor to Raychem Limited, United Kingdom

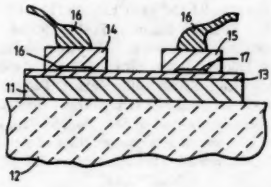
PCT No. PCT/GB89/00797, § 371 Date Jan. 14, 1991, § 102(e) Date Jan. 14, 1991, PCT Pub. No. WO90/00817, PCT Pub. Date Jan. 25, 1990

PCT Filed Jul. 13, 1989, Ser. No. 634,185

Claims priority, application United Kingdom, Jul. 13, 1988, 8816632

Int. Cl.[5] H01L *45/00*

U.S. Cl. 437—170 10 Claims



1. A method of producing an electrical device which comprises:

(a) reacting an amorphous silicon or silicon compound with a passivating agent in order to remove or reduce the number of unpaired electrons occurring in the silicon compound;

(b) providing a first electrode in association with the amorphous silicon compound either before or after step (a);

(c) providing a second electrode in association with the amorphous silicon compound either before or after step (a); and

(d) conducting a "forming" step in which at least part of the amorphous silicon compound layer is restructured by passing an electric current through the device;

the method including the formation of an n- or p- doped amorphous silicon layer which is adjacent to one of the electrodes and extends over part only of the device so that the maximum forming current passing through the device is limited to 400 mA.

5,151,385

METHOD OF MANUFACTURING A METALLIC SILICIDE TRANSPARENT ELECTRODE

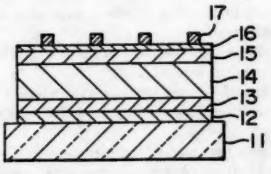
Hideaki Yamamoto, Tokorozawa; Koichi Seki; Toshihiro Tanaka, both of Hachioji; Akira Sasano, Tokyo; Toshihisa Tsukada, Tokyo; Yasuharu Shimomoto, Tokyo; Toshio Nakano, Tokyo, and Hideto Kanamori, Okazaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,144

Claims priority, application Japan, Dec. 16, 1982, 57-220641

Int. Cl.[5] H01L *21/00, 21/02, 29/48*

U.S. Cl. 437—181 17 Claims



1. A method of manufacturing a semiconductor device comprising the steps of forming a hydrogenated amorphous silicon (a-Si:H) layer over a given substrate; forming a metallic film on said hydrogenated amorphous silicon layer; effecting a heat treatment of the metallic film after formation of the metallic film to produce a transparent conductive layer by an interfacial reaction between said hydrogenated amorphous silicon layer and said metallic film; and removing at least a desired area of the metallic film to expose a portion of the transparent conductive layer for light incidence.

5,151,386

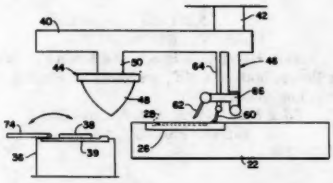
METHOD OF APPLYING METALLIZED CONTACTS TO A SOLAR CELL

Frank J. Bottari, Acton; Jack Hanoka, Brookline, and Frank W. Sylva, North Billerica, all of Mass., assignors to Mobil Solar Energy Corporation, Billerica, Mass.

Filed Aug. 1, 1990, Ser. No. 561,101

Int. Cl.[5] H01L *21/44, 21/48*

U.S. Cl. 437—187 20 Claims



1. A method for applying a metallized conductor to an uneven surface of a crystalline silicon semiconductor solar cell substrate comprising the following steps:

(a) providing a pad printing apparatus comprising (1) a plate having a top surface in which is etched a cavity corresponding in size and shape to that of a metallized conductor to be applied to the surface of a semiconductor substrate, (2) a flexible pad, and (3) a support for releasably supporting a semiconductor substrate, said support being positioned adjacent and in fixed relation to said plate;

(b) positioning a crystalline silicon semiconductor substrate on said support so that said surface of said substrate is exposed;

(c) filling said cavity of said plate with a metal-containing printing ink;

(d) contacting said plate with said pad so as to permit said printing ink to adhere to said pad;

(e) moving said pad into engagement with said one surface of said substrate; the composition and configuration of said pad, the depth of said cavity, and the composition of said printing ink being selected so that said printing ink is transferred to said one surface of said substrate with a uniform thickness in the range of 2–4 mils; and

(f) moving said pad out of contact with said substrate, whereby said printing ink is transferred to said one surface.

5,151,387

POLYCRYSTALLINE SILICON CONTACT STRUCTURE

James Brady, Dallas; Tsiu C. Chan, Carrollton, and David S. Culver, The Colony, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Apr. 30, 1990, Ser. No. 516,272

Int. Cl.[5] H01L *21/44*

U.S. Cl. 437—191 7 Claims

1. A method for forming a contact in a semiconductor integrated circuit device, comprising the steps of:

forming a first polycrystalline silicon interconnect layer having a first conductivity type;

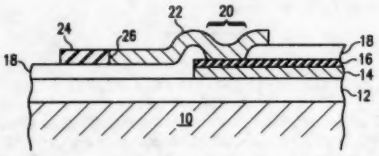
forming a silicide layer on the first polycrystalline silicon interconnect layer;

forming an insulating layer over the entire device;

forming a contact opening in the insulating layer, wherein a

contact region on an upper surface of the silicide layer is exposed;

forming a second polycrystalline silicon interconnect layer



having a second conductivity type over the insulating layer, wherein the second polycrystalline silicon interconnect layer makes ohmic contact with the silicide layer through the contact opening.

5,151,388

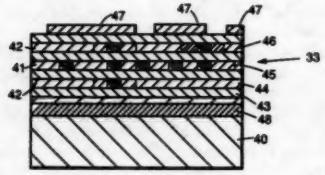
FLIP INTERCONNECT

Gabriel G. Bakhit, Huntington Beach, and Kevin P. Shambrook, Laguna Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 7, 1991, Ser. No. 697,350

Int. Cl.[5] H01L *21/60*

U.S. Cl. 437—209 **14 Claims**



1. A method of packaging a plurality of densely disposed integrated circuit chips comprising the following steps:

applying the connection pads of a plurality of integrated circuit chips to a decal-like multilayer interconnect, said multilayer interconnect comprising alternate layers of insulator and metal formed on a substrate and separated from said substrate by a sacrificial layer;

applying heat to said integrated circuit chips and to said interconnect to form an electrical connection therebetween;

pretesting electrically the performance of said integrated circuit chips;

dissolving said sacrificial layer with a suitable solvent;

floating the decal-like multilayer interconnect off said substrate;

bonding a heat sink to said integrated circuit chips on the side opposite the face thereof; and

packaging said integrated circuit chips in a container.

5,151,389

METHOD FOR DICING SEMICONDUCTOR SUBSTRATES USING AN EXCIMER LASER BEAM

Pierino I. Zappella, Garden Grove, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 10, 1990, Ser. No. 580,036

Int. Cl.[5] H01L *21/302*

U.S. Cl. 437—226 **8 Claims**

1. A method for dicing mercury cadmium telluride detector arrays on sapphire substrates to exact tolerances without edge chipping or edge detector degradation, comprising the steps of:

using an excimer laser beam from an excimer laser operating in the deep ultraviolet bandwidth to supply dicing energy for cutting dies from the arrays; and,

establishing guided relative movement between the beam and an array substrate within the relative angle between and beam and the substrate being out of normal to the substrate in the range 4 to 8 degrees to achieve ablative photodecomposition to effect said dicing without tapering edges of the substrate where cut.

5,151,390

SILICON NITRIDE-BASED FIBERS AND COMPOSITE MATERIAL REINFORCED WITH FIBERS

Hiroyuki Aoki; Tadashi Suzuki; Toshio Katahata; Mutsuo Haino; Genshiro Nishimura; Hiroshi Kaya; Kozaburo Tamura, and Takeshi Isoda, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 319,418, Mar. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 253,916, Oct. 4, 1988, Pat. No. 4,833,107, which is a continuation of Ser. No. 48,054, May 11, 1987, abandoned. This application Jul. 18, 1991, Ser. No. 732,997

Claims priority, application Japan, Jun. 13, 1986, 61-136242; Mar. 5, 1988, 63-52461

Int. Cl.[5] C04B *35/58*

U.S. Cl. 501—95 **9 Claims**

1. An amorphous inorganic silicon nitride-based fiber composed of silicon, nitrogen and carbon, optionally with oxygen and hydrogen, and having atomic ratio between above respective elements of N/Si=0.3 to 3, O/Si=up to 15, C/Si=up to 7 and H/Si=up to 15, wherein ratios of X-ray scattering intensity thereof to that of air at 1° and 0.5° are from 1 to 10 respectively and the silicon nitride-based fiber is still amorphous after heating in an inactive atmosphere at 1200° C. for 1 hour.

5,151,391

REACTIVATION OF SPENT, METAL-CONTAINING CRACKING CATALYSTS

Chia-Min Fu; Michael K. Maholland, both of Bartlesville, Okla., and Richard E. Lowery, Muscatine, Iowa, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 15, 1991, Ser. No. 657,709

Int. Cl.[5] B01J *20/34*

U.S. Cl. 502—27 **20 Claims**

1. A catalyst reactivation process comprising the steps:

(a) contacting a spent zeolite-containing catalytic cracking catalyst composition which contains at least one metal contaminant with a non-oxidizing acid solution consisting essentially of water and at least one inorganic acid selected from the group consisting of hydrochloric acid, nitric acid and sulfuric acid;

(b) at least partially separating the acid-treated catalyst composition obtained in step (a) from the aqueous solution used in step (a);

(c) drying the at least partially separated catalyst composition obtained in step (b); and

(d) contacting the dried catalyst composition obtained in step (c) with a solution comprising at least one antimony compound;

wherein said catalyst reactivation process is carried out under such conditions as to obtain a reactivated cracking catalyst composition exhibiting higher cracking activity and lower hydrogen generation than said spent zeolite-containing catalytic cracking catalyst composition, as determined during catalytic cracking of a hydrocarbon-containing oil substantially in the absence of added hydrogen gas.

5,151,392

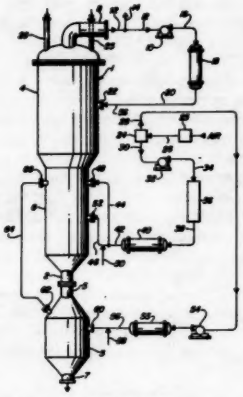
MOVING BED REGENERATION PROCESS WITH SEPARATE DISPERSION AND CHLORIDING STEPS

Michael E. Fettis, Prospect Heights, and Paul R. Cottrell, Arlington Heights, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 448,465, Dec. 11, 1989, abandoned. This application Feb. 28, 1991, Ser. No. 662,302

Int. Cl.[5] B01J *38/44, 23/96, 8/12;* C10G *35/12*

U.S. Cl. 502—37 14 Claims



1. A process for reforming a hydrocarbon feedstock said process comprising:

(a) passing said hydrocarbon feedstock to a catalytic reforming reaction system and contacting said feedstock with reconditioned catalyst particles comprising a noble metal on an alumina carrier and a chloride compound, and recovering a hydrocarbon product;

(b) at least semicontinuously removing deactivated catalyst particles from said reforming reaction system and adding at least partially reconditioned catalyst particles to said reforming reaction system;

(c) passing deactivated catalyst particles from said reforming reaction system to a regeneration zone;

(d) contacting deactivated catalyst particles having coke deposited thereon in a first section of said regeneration zone with an oxygen containing gas to remove coke by combustion, said oxygen containing gas having an oxygen concentration of from 0.5 to 1.5% volume;

(e) contacting said catalyst particles having coke removed therefrom with a heated gas stream in a second section of said regeneration zone to remove water from said catalyst particles and produce dried catalyst particles having a moisture content of less than 1 wt. %;

(f) contacting said dried catalyst particles in a third section of said regeneration zone with a redispersion gas comprising 0.01 to 0.2 mol. % chlorine to redisperse said noble metal and produce catalyst particles having a redispersed noble metal;

(g) discontinuing the contacting of said catalyst particles with said redispersion gas and contacting said catalyst particles having a redispersed noble metal in a fourth section of said regeneration zone with a chloriding gas stream comprising 0.05 to 0.3 wt. % HCl based on the mass of catalyst particles in said fourth section and oxygen at a temperature of less than 1000° F. to maintain a concentration of chloride on said catalyst from 0.4 to 1.4 wt. % and produce a chlorided catalyst; and,

(h) recovering at least partially reconditioned catalyst particles from said regeneration zone for return to said reaction zone in step (b).

5,151,393

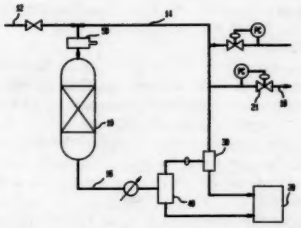
STAGED PROCESS FOR REACTIVATION OF SPENT ZEOLITE CATALYST PARTICLES

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 23, 1991, Ser. No. 689,570

Int. Cl.[5] B01J *38/10, 29/38;* C07C *11/20;* C10G *11/05*

U.S. Cl. 502—53 9 Claims



1. A process for the reactivation of spent medium pore metallosilicate catalyst particles containing carbonaceous deposits, comprising:

contacting said spent catalyst particles with hydrogen at pressure between about 3500 and 21000 kPa and temperature between 360° C. and 815° C. under first stage catalyst reactivation conditions to partially reactivate said spent particles; and

contacting said partially reactivated particles with a light gas stream selected from the group consisting of hydrogen, nitrogen, and refinery fuel gas at temperature greater than 760° C., under second stage catalyst reactivation conditions, at a pressure substantially lower than said first stage sufficient to provide a pressure differential between said first and said second stage of at least 3010 kPa, whereby reactivated metallosilicate catalyst particles are produced.

5,151,394

CRACKING CATALYSTS

Girish K. Chitnis, Chadds Ford, Pa., and Joseph A. Herbst, Turnersville, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 25, 1991, Ser. No. 645,761

Int. Cl.[5] B01J *29/04, 27/14*

U.S. Cl. 502—65 16 Claims

1. A catalyst composition comprising a catalytic molecular sieve material and a matrix material comprising boron phosphate compound.

2. The catalyst composition of claim 1 wherein the molecular sieve material is selected from a group consisting of large pore zeolites X, Y, USY, REX, REY, RE-USY, dealuminated Y, silicon enriched dealuminated Y, large pore materials SAPO-5, SAPO-37, pillared clays, intermediate pore zeolites ZSM-5, ZSM-11, ZSM-22, ZSM-23, ZSM-35, ZSM-48, ZSM-57, and MCM-22 and combinations thereof.

4. The catalyst composition of claim 1 wherein the matrix material further comprises at least one member of a group consisting of silica, alumina, titania, zirconia, magnesia, kaolin, bentonite and combinations thereof.

5,151,395

BULK GAS SORPTION AND APPARATUS, GAS CONTAINMENT/TREATMENT SYSTEM COMPRISING SAME, AND SORBENT COMPOSITION THEREFOR

Glenn M. Tom, New Milford, Conn., assignor to Novapure Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 295,419, Jan. 10, 1989, Pat. No. 5,037,624, which is a continuation-in-part of Ser. No. 163,792, Mar. 3, 1988, Pat. No. 4,953,792, which is a division of Ser. No. 29,632, Mar. 24, 1987, Pat. No. 4,761,395, which is a continuation-in-part of Ser. No. 323,311, Mar. 11, 1989. This application Mar. 16, 1990, Ser. No. 495,790

Int. Cl.[5] B01J *20/18, 20/02*

U.S. Cl. 502—67 11 Claims

1. A sorbent composition comprising an arrangement of first and second sorbent beds, wherein the first sorbent bed comprises a hygroscopic aluminosilicate sorbent, and the second sorbent bed comprises an aluminosilicate sorbent impregnated with an aqueous base solution, wherein the first and second sorbent beds are arranged for initial gas contacting with the first sorbent bed and succeeding gas contacting with the second sorbent bed.

2. A composition according to claim 1, wherein the aluminosilicate sorbent comprises molecular sieve.

3. A sorbent composition according to claim 1, wherein the aqueous base solution comprises an alkali or alkaline earth metal hydroxide.

5,151,396

PROCESS FOR THE POLYMERIZATION OF ETHYLENE AND CATALYTIC COMPONENT THEREFOR

Roger Spitz, Saint-Symphorien d'Ozon; Jean Malinge, Orthez, and Jean-Francois Joly, Chatillon sous Bagneux, all of France, assignors to Atochem, Puteaux, France

Filed Nov. 13, 1989, Ser. No. 436,059

Claims priority, application France, Nov. 23, 1988, 88 15261

Int. Cl.[5] B01J *31/00*

U.S. Cl. 502—104 18 Claims

1. A catalytic component for use in the homopolymerization of ethylene or copolymerization of ethylene with an alpha-olefin to form polymers having a broad molecular weight distribution, said component being a solid and consisting essentially of the combination of a chlorinated titanium compound mainly at the oxidation state of 3 and/or 4 and having the formula $Ti(OR)_{xl}Cl_{4-x}$, in which:

(i) R is a C_1 to C_{14} aliphatic or aromatic hydrocarbon radical, or COR^1 with R^1 being a C_1 to C_{14} aliphatic or aromatic hydrocarbon radical, and (ii) x is a number from 0 to 3, a magnesium compound and a chlorine compound, treating said solid component with a reducing agent capable of reducing the degree of oxidation of Ti^4 and/or Ti^3 and after such treatment contacting the component with a chlorine-containing transition metal compound consisting essentially of a chloride, an alkoxychloride or an oxychloride of a transition metal selected from among titanium, vanadium, chromium and zirconium.

5,151,397

METHOD OF PRODUCING METAL HALIDE CATALYST

Kent E. Mitchell, Bartlesville, and Stanley J. Marivil, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 16, 1991, Ser. No. 808,785

Int. Cl.[5] C08F *4/64*

U.S. Cl. 502—107 18 Claims

1. A process for preparing a catalyst comprising:

(1) mixing a metal halide compound, a solvent and water to produce a metal halide solution, wherein the metal of said metal halide compound is selected from Group IIA metals and Group IIB metals of the Meneleev Periodic Table and said water is present in an amount sufficient to increase particle size of said catalyst;

(2) contacting said metal halide solution with a transition metal compound to form a first catalyst component solution; and

(3) contacting said first catalyst component solution with a precipitating agent to form said catalyst.

5,151,398

CATALYST FOR THE SYNTHESIS OF CRYSTALLINE 3,4-POLYISOPRENE

Wen-Liang Hsu, Copley, and Adel F. Halasa, Bath, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 602,546, Oct. 24, 1990, Pat. No. 5,082,906. This application Jun. 17, 1991, Ser. No. 716,475

Int. Cl.[5] C08F *4/70*

U.S. Cl. 502—117 10 Claims

1. A catalyst system which can be utilized in the polymerization of isoprene monomer into 3,4-polyisoprene, said catalyst system being comprised of (a) an organoiron compound, which is soluble in the organic solvent, wherein the iron in the organiron compound is in the +3 oxidation state,(b) partially hydrolized organoaluminum compound, which was prepared by adding a protonic compound selected from the group consisting of water, alcohols and carboxylic acids to the organoaluminum compound, and (c) a chelating aromatic amine; wherein the molar ratio of the chelating amine to the organoiron compound is within the range of about 0.1:1 to about 1:1, wherein the molar ratio of the organoaluminum compound to the organoiron compound is within the range of about 5:1 to about 200:1, and wherein the molar ratio of the protonic compound to the organoaluminum compound is within the range of about 0.001:1 to about 0.2:1.

5,151,399

OLEFIN POLYMERIZATION CATALYST

Robert C. Job, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 18, 1990, Ser. No. 599,538

Int. Cl.[5] C08F *4/04*

U.S. Cl. 502—127 15 Claims

1. An olefin polymerization catalyst produced by contacting (A) a solid olefin polymerization procatalyst obtained by contacting the solution resulting from the reaction of magnesium, a titanium tetraalkoxide, an alkyl borate ester and an alkanol, in inert diluent at elevated temperature, with a tetravalent titanium halide, a halohydrocarbon and an electron donor, with (B) an organoaluminum compound cocatalyst and a selectivity control agent.

5,151,400

PROCESS FOR THE ACTIVATION OF HALOGENATED CATALYSTS AND CATALYSTS OBTAINED BY SAID PROCESS FOR UTILIZATION IN HYDROCARBON CONVERSION PROCESSES

Georges Szabo, Montivilliers; Egbertus F. P. Schasfoort, Pays-Bas, and Alain Milan, Montivilliers, all of France, assignors to Compagnie de Raffinage et de Distribution Total France, Levallois, France

Filed Jul. 18, 1990, Ser. No. 554,298

Claims priority, application France, Jul. 18, 1989, 89 09630

Int. Cl.[5] B01J *27/125, 27/13, 27/132, 27/135*

U.S. Cl. 502—203 14 Claims

1. A process for the preparation and activation of a catalyst, comprising:

fabricating a catalyst support consisting at least in part of at least one refractory oxide mineral,

depositing on the catalyst support at least one metal from the platinum group,

forming on the catalyst support, and thereby completing the preparation of the catalyst, at least two metal halides of the Lewis acid type, the first halide belonging to the family of halides of zirconium, molybdenum, tungsten or

titanium, and the second halide belonging to the family of the halides of aluminum, boron or gallium, and

activating the prepared catalyst by maintaining in an acidic and nonoxidizing or reducing medium at a temperature between about 300° and 475° C. until the final content of zirconium, molybdenum, tungsten or titanium in the catalyst ranges from 0.15 to 1 percent, based on the weight of the support.

5,151,401

PREPARATION OF DEHYDROGENATING CATALYST

Paul F. Schubert, Sunnyvale, Calif.; Donald H. Kubicek, Bartlesville, and Dennis R. Kidd, Dewey, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 615,518, Nov. 19, 1990, abandoned. This application Jan. 6, 1992, Ser. No. 818,417

Int. Cl.[5] B01J *37/06, 23/58, 23/60*

U.S. Cl. 502—329 **12 Claims**

1. A process for preparing a dehydrogenation catalyst, said process comprising the following steps performed in the sequence set forth:

(a) impregnating a porous zinc aluminate catalyst support containing calcium aluminate with a solution containing a compound of platinum with chlorine to form a supported catalyst;

(b) drying the supported catalyst of step (a);

(c) calcining the dried catalyst of step (b); and

(d) washing the calcinated catalyst of step (c) with a wash media under conditions sufficient to remove substantially all chloride ions from said support while retaining substantially all platinum contained on said support, thereby producing said dehydrogenation catalyst wherein the chlorine content is less than about 0.05 weight percent.

5,151,402

SILYLATION OF CHARCOAL TO INCREASE ITS HYDROPHOBICITY

Marjory T. Craw, Chalk River; Kevin D. McCrimmon, Deep River, and Lyse L. Deschenes, Chalk River, all of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Nov. 28, 1990, Ser. No. 619,242

Int. Cl.[5] B01J *20/22, 20/32*

U.S. Cl. 502—401 **27 Claims**

1. A process for chemically modifying charcoal to increase its hydrophobicity by exposing the charcoal to a non-chlorinated organo-silane for sufficient time and at a sufficient temperature to coat the charcoal with silane to yield a surface area reduction of the charcoal of not more than 50 percent.

10. The process of claim 1, further comprising the step of humidifying the charcoal, prior to silylation, by contacting the charcoal with water vapour for a sufficient time to produce a charcoal containing up to 10 weight percent water vapour.

17. The process of claim 10 wherein the charcoal is exposed to the non-chlorinated organo-silane by refluxing in the presence of an organic solvent from about 1 to about 5 hours.

22. Silylated vegetable-based charcoal wherein the charcoal has been silylated with a non-chlorinated organosilane to yield a silylated charcoal with a surface area from about 500 m^2/ g to about 800 m^2/ g.

5,151,403

THERMAL PRINTING MEDIUM, AND LABEL AND TAG INCORPORATING THE SAME

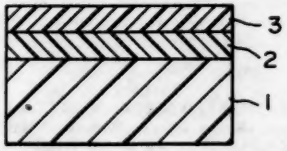
Akira Suzuki; Takayuki Norizuki, and Yasuhiro Yamanashi, all of Shizuoka, Japan, assignors to Tomoegawa Paper Co., Ltd., Tokyo, Japan

Filed Feb. 15, 1991, Ser. No. 655,860

Claims priority, application Japan, Feb. 16, 1990, 2-13692[U]; Feb. 16, 1990, 2-33801

Int. Cl.[5] B41M *5/30, 5/36, 5/40*

U.S. Cl. 503—200 **11 Claims**



1. A thermal printing medium comprising:

a) a support substrate comprised of polyolefin cross-laminate film and having an upper and a lower surface; said cross-laminate film being characterized by at least two sheets of polyolefin having polyolefin adhesive therebetween, and being further characterized by said of said sheets having a linear, parallel aligned macromolecular orientation, the orientation of the macromolecules in one sheet forming an angle relative to the orientation of the macromolecules in a second sheet in the cross-laminated film;

b) a thermal developing layer formed on said upper surface of said support substrate, said thermal developing layer including at least one of a colorless and a lightly colored leuco dye, and a color developer agent as principle components thereof; and

c) a protective layer formed on said upper surface of said thermal developing layer.

5,151,404

THERMOSENSITIVE RECORDING PAPER

Aimi Suzuki, Numazu; Toshiaki Azuma, Mishima; Shigeaki Kimura, and Yasuyuki Hosogi, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 7, 1990, Ser. No. 623,528

Claims priority, application Japan, Dec. 7, 1989, 1-316553

Int. Cl.[5] B41M *5/30*

U.S. Cl. 503—200 **9 Claims**

1. A thermosensitive recording paper comprising a support sheet and a thermosensitive coloring layer formed thereon, said support sheet comprising a needle-leaf tree pulp comprising fibers, in an amount of 10 to 50 wt. % of the absolute dry weight of said support sheet, with the maximum length of said fibers of said needle-leaf tree pulp being 4 mm or less.

5,151,405

MODIFIED DEXTRAN BINDER FOR USE IN THERMAL DYE TRANSFER

Wilhelmus Janssens, Langdorp; Herman J. Uytterhoeven, Bonheiden; Joan T. Vermeersch, Deinze, and Jan A. Van der Bogaert, Schilde, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Feb. 21, 1991, Ser. No. 658,584

Claims priority, application European Pat. Off., Mar. 1, 1990, 90200481.1

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 **11 Claims**

11. Method of image-wise heating a dye-donor element comprising a support and a dye layer comprising printing dyes carried by a polymeric binder medium, which at least partially is a dextran binder, at least some of the hydroxy groups of

which have been modified into ether, carboxylic ester, carbonate, carbamoyloxy, hemiacetal, or acetal groups and, in case only part of the hydroxy groups of said dextran binder have been modified in such groups, at least part of the remaining hydroxy groups have been modified into groups that are more hydrophilic or more polar than said ether, carboxylic ester, carbonate, carbamoyloxy, hemiacetal, and acetal groups and transferring said image-wise heated printing dyes to a dye-image-receiving layer of a receiving sheet, wherein said dye-image-receiving layer comprises a dextran binder, part of the hydroxy groups of which have been modified into ether, carboxylic ester, carbonate, carbamoyloxy, hemiacetal, or acetal groups and the other part of the hydroxy groups have been modified into groups that are more hydrophilic or more polar than said ether, carboxylic ester, carbonate, carbamoyloxy, hemiacetal, or acetal groups.

5,151,406

LAMINATED SUPERCONDUCTOR

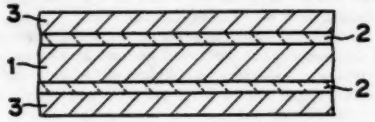
Kazuo Sawada; Kengo Okura; Noriyuki Yoshida; Satoshi Takano; Kenji Miyazaki, and Noriki Hayashi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 25, 1988, Ser. No. 160,115

Claims priority, application Japan, Feb. 26, 1987, 62-44266; Aug. 24, 1987, 62-209932

Int. Cl.[5] B32B *9/00*

U.S. Cl. 505—1 **6 Claims**



1. A laminated ceramic superconductor which comprises at least two layers of a ceramic superconductor having a layer perovskite crystal structure and a composition formula of

$$YBa_2Cu_3O_{6.8} \text{ or } (M^1_{1-x}M^2_x)_2M^3M^4_{4-y}$$

wherein M^1 is an element selected from the lanthanum series of elements M^2 is an element selected from the elements of the IA IIA, and IIIB groups, M^3 is an element selected from the group consisting of elements of the IB, IIB and IIIA groups and transition elements, M^4 is an element selected from the group consisting of oxygen, Boron, carbon, nitrogen, flourine, and sulfur, x is a number larger than zero and smaller than one, and y is a number not smaller than zero and smaller than four; and a stabilizing conductive metal layer, formed from a material selected from the group consisting of copper, aluminum, silver and gold, interposed between said ceramic superconductor layers.

5,151,407

METHOD OF PRODUCING BI-SR-CA-CU-O SUPERCONDUCTING MATERIALS IN CAST FORM

Virgil Provenzano, Bethesda, Md.; Anand K. Singh, Middletown, N.J.; M. A. Imam, Annandale, Va.; Kuntimadi Sadananda, Springfield, and William F. Henshaw, Lorton, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1990, Ser. No. 489,313

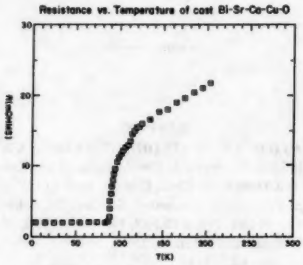
Int. Cl.[5] C01F *11/02*; C01G *3/02, 29/00*; C04B *35/60*

U.S. Cl. 505—1 **9 Claims**

1. A method of producing a superconducting material in bulk form, comprising the steps of:

heating a powder of a starting material for a perovskite superconducting material to a temperature at or above which it forms a pourable liquid, but below the decomposition or boiling point of said liquid;

casting a bulk form of said superconducting material by pouring said liquid into a mold, maintaining said liquid in said mold until said liquid begins to solidify to a hot, cast object, removing said hot, cast object from said mold and



cooling said hot, cast object to room temperature at a rate sufficiently slow to prevent the embrittlement or cracking of said cast object; and

annealing said cooled cast object, said temperature and time of annealing being sufficient to restore the level of O_2 in said cooled cast object to near equilibrium levels wherein said superconducting material is the Bi-Sr-Ca-Cu-O system with a 2:2:2:3 atomic ratio.

5,151,408

PROCESS FOR PREPARING A-AXIS ORIENTED HIGH-TEMPERATURE SUPERCONDUCTING THIN FILMS

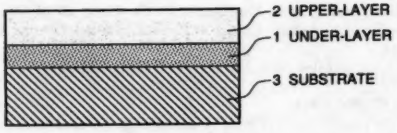
Saburo Tanaka; Hidenori Nakanishi, and Hideo Itozaki, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 11, 1991, Ser. No. 668,263

Claims priority, application Japan, Mar. 9, 1990, 2-58512; Mar. 9, 1990, 2-58513

Int. Cl.[5] B05D *5/12*

U.S. Cl. 505—1 **12 Claims**



1. A process for preparing a-axis oriented thin film of oxide superconducting material, characterized by the steps of:

depositing an under-layer of said oxide superconducting material on a substrate under such a condition that said substrate is heated at a temperature which is suitable to realize an a-axis orientation of crystal of said oxide superconducting material, and then

depositing an upper-layer of said oxide superconducting material on a surface of said under-layer under such a condition that said substrate is heated at a temperature which is higher by 10° to 100° C. than said temperature which is used in the first depositing step,

wherein said under-layer is deposited up to a thickness of 20 to 1,000 A.

5,151,409

SUPERCONDUCTING COMPOSITION COMPRISING LN-TH-CU-O, WHEREIN LN IS PR, ND, PM, SM, EU, GD, ER OR MIXTURES THEREOF

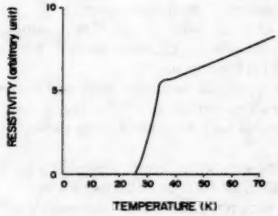
Masahiko Hiratani, Akishima; Shin'ichiro Saitoh, Tokyo; Katsuki Miyauchi, Hino, and Tsuyoshi Seko, Higashimurayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 24, 1990, Ser. No. 469,225

Claims priority, application Japan, Jan. 27, 1989, 1-016141; Jan. 27, 1989, 1-016142; Jan. 27, 1989, 1-016143; Feb. 17, 1989, 1-036128; Mar. 3, 1989, 1-049827; Mar. 10, 1989, 1-056418

Int. Cl.[5] C01B *13/00;* C01F *15/00;* C01G *3/02;* H01L *39/12*

U.S. Cl. 505—1 3 Claims



1. An oxide superconductor having a composition expressed by a chemical formula $Ln_{2-x}M_xCuOy$, where Ln indicates at least one element selected from a group consisting of Pr, Nd, Pm, Sm, Eu, Gd, and Er, wherein M is limited to Th and $3.5 \leqq y \leqq$.

5,151,410

USE OF A SPIRANIC COMPOUND AS A PERFUMING INGREDIENT

Wolfgang K. Giersch, Bernex; Pierre-Alain Blanc, Crassier, and Karl-Heinrich Schulte-Elte, Onex, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Filed Feb. 6, 1992, Ser. No. 832,205

Claims priority, application Switzerland, Mar. 15, 1991, 796/91

Int. Cl.[5] A61K *7/46*

U.S. Cl. 512—9 5 Claims

1. A method to confer, improve, enhance or modify the odor properties of a perfuming composition or a perfumed article, which method comprises adding to said composition or article a fragrance effective amount of spiro[5.7]tridec-1-ene-3-one.

5,151,411

TRICYCLIC KETONES AND FRAGRANCE COMPOSITIONS CONTAINING SAME

Georg Fráter, Uster, and Daniel Helmlinger, Gockhausen, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

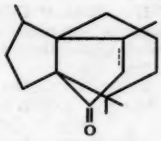
Filed Aug. 20, 1991, Ser. No. 747,816

Claims priority, application Switzerland, Aug. 24, 1990, 2756/90

Int. Cl.[5] A61K *7/46*

U.S. Cl. 512—15 22 Claims

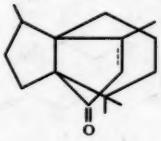
1. A compound of the formula



I

wherein the dotted line represents an optional bond.

8. An odorant composition, which comprises an olfactorily effective amount of a compound of the formula



I

wherein the dotted line signifies an optional bond, and at least one other olfactive agent.

5,151,412

PHARMACEUTICALLY ACTIVE CONJUGATES HAVING IMPROVED BODY TISSUE BINDING SPECIFICITY

Robert A. Brown, St. Albans, Great Britain, assignor to Central Blood Laboratories Authority, Borehamwood, Great Britain

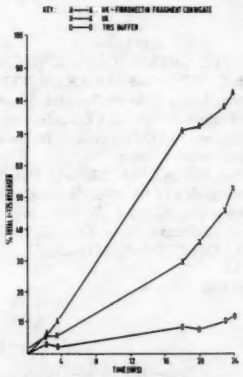
PCT No. PCT/GB87/00854, § 371 Date Jul. 21, 1989, § 102(e) Date Jul. 21, 1989, PCT Pub. No. WO88/03810, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 27, 1987, Ser. No. 359,662

Claims priority, application United Kingdom, Nov. 27, 1986, 8628398

Int. Cl.[5] A61K *37/12, 47/48, 37/14;* C07K *17/02*

U.S. Cl. 514—8 18 Claims



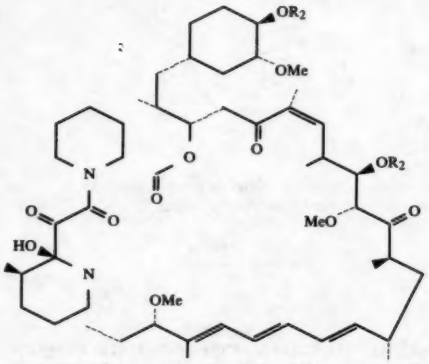
1. A pharmaceutically active conjugate comprising an anti-rheumatic agent for treating rheumatic disease, wherein said anti-rheumatic agent is conjugated directly or indirectly with at least one fragment of fibronectin having improved gelatin-binding specificity compared with that of a whole parent fibronectin molecule, wherein said fibronectin fragment does not exhibit cell attachment activity.

5,151,413
RAPAMYCIN ACETALS AS IMMUNOSUPPRESSANT AND ANTIFUNGAL AGENTS

Craig E. Caufield, Plainsboro, N.J., and Guy A. Schiehser, Yardley, Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 6, 1991, Ser. No. 788,682
Int. Cl.[5] A61K *31/695, 31/395;* C07D *498/16, 7/04*
U.S. Cl. 514—63 13 Claims

5. A method of treating transplant rejection and host vs graft disease, autoimmunine disease and disease of inflammation in a mammal by administering thereto an effective amount of a compound having the formula:



wherein R^1 and R^2 independently are hydrogen, $—CH_2YX$, $—C(CH_3)_2YX$, $—CH_2(CH_3)YX$, or L;

Y is O or S; X is $—CH_3$, $—(CH_2)_nCH_3$, $—CH_2C_6H_6$, $—(CH_2)_2OCH_3$, $—CH_2Cl_3$ or $—CH_2CH_3Si(CH_3)_3$ and L is selected from tetrahydrofuran-2-yl, tetrahydrothiophen-2-yl, tetrahydrothiopyran-2-yl, tetrahydropyran-2-yl, 4-methoxytetrahydropyran-2-yl, 4-methoxytetrahydrothiopyran- 2-yl, or 4-methoxytetrahydrothiopyran-S, S-dioxide-2-yl with a proviso that R^1 and R^2 cannot simultaneously be hydrogen and n is 1–5.

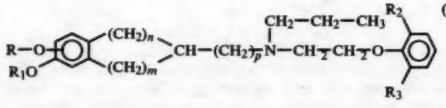
8. A method according to claim 5 wherein the compound used is 31-[O-[2-(trimethylsilyl)ethoxy]methyl]rapamycin.

5,151,414
PHENOXYETHYL AMINE COMPOUNDS ACTIVE ON THE CARDIOVASCULAR SYSTEM

Cesare Casagrande, Arese; Gabriele Norcini, Somma Lombardo; Francesco Santangelo, Milan, and Claudio Semeraro, Bresso, all of Italy, assignors to SIMES Societa Italiana Medicinali e Sintetici S.p.A., Vicenza, Italy

Division of Ser. No. 659,542, Feb. 22, 1991, Pat. No. 5,070,106, which is a continuation of Ser. No. 288,263, Dec. 22, 1988, abandoned. This application Jul. 31, 1991, Ser. No. 738,608
Claims priority, application Italy, Dec. 23, 1987, 23183 A/87
Int. Cl.[5] C07C *229/38;* A61K *31/22, 31/24*
U.S. Cl. 514—114 8 Claims

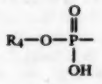
1. A compound of formula



(I)

wherein

R and R_1, the same or different, represent hydrogen atoms or acyl groups derived from optionally substituted aliphatic, aromatic or heteroaromatic carboxylic acids, from optionally substituted carbamic or carbonic acids, or from a phosphoric acid of formula



wherein

R_4 represents a hydrogen atom, a C_1–C_6 alkyl optionally substituted by one or more groups selected from hydroxy, alkoxy, acyloxy, amino, carboxy and alkoxycarbonyl; or a phenyl; provided that when one of R and R_1 represents an acyl derived from phosphoric acid, the other represents a hydrogen atom;

the group O-R is bonded to one of the positions adjacent to the O-R_1 group; with the proviso that at most one of R and R_1 is hydrogen;

n and p each represents an integer selected between 0 and 1;

m represents an integer selected from 1, 2, 3 and 4 such that n+p=1 and m+n represent an integer selected from 2, 3 and 4;

R_2 and R_3, the same or different, represent a hydrogen or a halogen atom, an alkyl or an alkoxy group;

and their salts with pharmaceutically acceptable acids.

8. A method for the treatment of hypertension, of cardiac insufficiency and decompensation and of cerebral and peripheral vascular diseases consisting in administering a therapeutically effective amount of a compound according to claim 1.

5,151,415
METHOD OF TREATING A PAPOVA-TYPE VIRAL INFECTION

Dallas Sirany, 5733 Dumas Ave., Minnetonka, Minn. 55345

Filed May 23, 1991, Ser. No. 704,452
Int. Cl.[5] A01N *37/36;* A61K *31/61, 31/615*
U.S. Cl. 514—163 27 Claims

1. A method for treating a body surface infection of a papova-type viral epithelial tumor, the method comprising:

applying an effective amount of a paste containing acetylsalicylic acid and water in a layer having a thickness of between about 0.8 mm and 10.0 mm over epithelial tumor; and

maintaining the paste in contact with the epithelial tumor for a treatment period sufficient to affect the infection.

5,151,416
METHOD OF EXTERMINATING RODENTS AND OTHER VERTEBRATE PESTS

Hector F. DeLuca, Deerfield, and Connie M. Smith, Madison, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 352,963, May 17, 1989, abandoned. This application Apr. 24, 1991, Ser. No. 691,178
Int. Cl.[5] A01N *45/00;* G07J *172/00*
U.S. Cl. 514—167 11 Claims

1. A method for controlling vertebrate pest populations which comprises making available in a diet of such populations edible material acceptable to the vertebrate pest, which edible material contains ingredients toxic to said pest, said toxic ingredients consisting of 1α-hydroxyvitamin D_3 in an amount of from about 4 parts per million to about 5 parts per million and calcium in an amount of from about 2% to about 2.6% by weight in said diet.

5,151,417
3-SUBSTITUTED VINYL CEPHALOSPORIN DERIVATIVES

Manabu Sasho; Hiroshi Yamauchi, both of Ibaraki; Motosuke Yamanaka; Takaharu Nakamura, both of Chiba; Kanemasa Katsu, Ibaraki; Isao Sugiyama, Ibaraki; Yuuki Komatu, Ibaraki, and Shigeto Negi, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

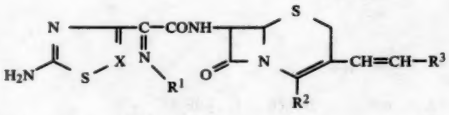
Filed Jul. 10, 1990, Ser. No. 550,365

Claims priority, application Japan, Jul. 13, 1989, 1-178989; Jul. 18, 1989, 1-183689; Sep. 22, 1989, 1-244928; Oct. 13, 1989, 1-265153; Feb. 5, 1990, 2-24413

Int. Cl.[5] C07D *501/32*; A61K *31/545*

U.S. Cl. 514—202 **12 Claims**

1. A 3-substituted vinyl cephalosporin derivative represented by the following formula:



wherein

R^1 represents a hydroxyl or lower alkoxy group;

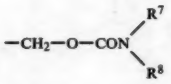
X represents —CH═;

R^2 represents a carboxyl group or a carboxyl group protected with a protecting group; and

R^3 represents:

(1) a group represented by the formula $—CH_2OCONHR^4$ wherein R^4 is a hydrogen atom, a lower alkyl group, a halogenated lower alkyl group or a lower alkenyl group, or

(2) a group represented by the formula



wherein R^7 and R^8 are the same or different and are individually a hydrogen atom, a lower alkyl group, a halogenated lower alkyl group or a lower alkenyl group or R^7 and R^8 may form a morpholino ring together with the nitrogen atom to which R^7 and R^8 are bonded, or a pharmaceutically acceptable salt thereof.

5,151,418
METHOD OF TREATING MUSCULAR TENSION, MUSCLE SPASTICITY AND ANXIETY WITH 3-ARYLOXY AND 3-ARYLTHIOAZETIDINECARBOXAMIDES

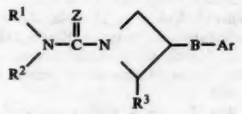
Chandler R. Taylor, Jr.; Albert D. Cale, Jr., both of Mechanicsville; David N. Johnson, Richmond, and Harold F. Stauffer, Jr., Midlothian, all of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation of Ser. No. 921,521, Oct. 22, 1986, Pat. No. 5,068,231, which is a continuation-in-part of Ser. No. 706,632, Feb. 28, 1985, abandoned. This application Aug. 9, 1991, Ser. No. 743,486

Int. Cl.[5] A61K *31/395*; C07D *205/04*

U.S. Cl. 514—210 **17 Claims**

1. A method of treating anxiety in animals, including humans, by administering an effective amount of a compound selected from the group having the formula:



wherein:

Ar is pyridyl in any of its positions optionally substituted by halo, phenyl or phenyl substituted by 1 or 2 groups selected from chloro, bromo, iodo, fluoro, loweralkyl, loweralkoxy, nitro, aminocarbonyl, or trifluoromethyl;

B is oxygen or sulfur;

Z is oxygen or sulfur;

R^1 and R^2 may be the same or different and are selected from hydrogen, loweralkyl, phenyl, phenyl substituted by halo, loweralkyl, loweralkoxy, nitro, cyano, trifluoromethyl, carbomethoxy or carboethoxy; allyl, substituted allyl, propargyl, cycloalkyl (3–9C), loweralkylcycloalkyl, cycloalkylloweralkyl, arylloweralkyl wherein aryl is phenyl or phenyl substituted by halo, loweralkyl, loweralkoxy, nitro, cyano, trifluoromethyl, carbomethoxy, or carboethoxy; and diloweralkylaminoloweralkyl, and R^1 and R^2 when taken together with the adjacent nitrogen atom may form a heterocyclic amino group selected from azetidinyl, pyrrolidinyl, piperidinyl, homopiperidinyl, imidazolyl, piperazinyl, (halophenyl) piperidin-yl, phenyl-1,2,3,6-tetrahydropyridin-1-yl, phenylpiperidin-1-yl, hydroxypiperidin-1-yl, 4-morpholino, 4-(3,5-diloweralkyl)morpholino, 1,2,3,6-tetrahydropyridin-1-yl, (halophenyl)(hydroxy)-piperidin-1-yl, 4-(2,6-diloweralkyl)morpholino, pyrrolo[1,2-a]pyrazin-2-yl, homopiperazinyl, 4-substituted piperazinyl, and 4-substituted homopiperazinyl;

R^3 is selected from hydrogen, loweralkyl, aryl or aryllower-alkyl wherein aryl or the aryl moiety is phenyl or phenyl substituted by halo, loweralkyl, loweralkoxy, nitro, cyano, trifluoromethyl, carbomethoxy or carboethoxy; the geometrical isomers including cis, trans, (E) and (Z) isomers thereof, and the pharmaceutically acceptable acid addition salts thereof when R^1 and R^2 have one or more salt-forming basic amino groups, or Ar is pyridyl, and the hydrates thereof.

5,151,419
COMPOSITION FOR THE TREATMENT OF SCHIZOPHRENIA

Andras Perenyi, Budapest, Hungary; Goswami Utpal, Calcutta, India; Mihály Arató, Budapest, Hungary; Ede Frescka, Budapest, Hungary; József Knoll, Budapest, and D. Arpad Béla, Gyongyos, Hungary, assignors to Chinoin Gyogyszer- ES Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

PCT No. PCT/HU89/00044, § 371 Date Jun. 18, 1990, § 102(e) Date Jun. 18, 1990, PCT Pub. No. WO90/01928, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 17, 1989, Ser. No. 536,658

Claims priority, application Hungary, Aug. 17, 1988, 4374/88

Int. Cl.[5] A61K *31/54, 31/135, 31/445*

U.S. Cl. 514—226.2 **6 Claims**

1. A method of treating schizophrenia in a patient characterized by negative symptoms, which comprises administering to said patient, a therapeutically effective amount of (−)-N-(1-phenyl-isopropyl)-N-methyl-propynylamine or a pharmaceutically acceptable acid addition salt thereof.

5,151,420
SUBSTITUTED PYRIDAZINONES

Reijo J. Backstrom, Helsinki; Kalevi E. Heinola, Jarvenpaa; Pentti T. Nore, Helsinki; Jarmo J. Pystynen, Espoo; Erkki J. Honkanen, Vantaa, and Heimo O. Haikala, Espoo, all of Finland, assignors to Orion Corporation/Orion Pharmaceutica, Espoo, Finland

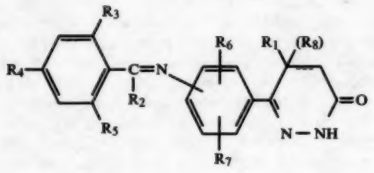
Continuation of Ser. No. 404,532, Sep. 8, 1989, abandoned. This application Mar. 8, 1990, Ser. No. 489,187

Claims priority, application United Kingdom, Oct. 19, 1988, 8824458

Int. Cl.[5] **C07D** *237/14*

U.S. Cl. 514—247 **22 Claims**

1. A compound of formula I:



I

wherein R_1 and R_8 each independently is a member selected from the group consisting of hydrogen and a lower alkyl group; R_2 is selected from the group consisting of hydrogen, lower alkyl, trifluoromethyl, hydroxy C_{1-18} alkyl, halogen C_{1-18} alkyl, C_{1-18} alkoxy C_{1-18} alkyl, C_{3-6} cycloalkyl, phenyl optionally substituted with one to three members selected from the group consisting of halogen, hydroxy, C_{1-18} alkoxy, amino and cyano groups, phenyl C_{1-3} alkyl optionally substituted with one to three members selected from the group consisting of halogen, hydroxy, C_{1-18} alkoxy, amino and cyano groups, phenyl C_{2-3} alkenyl optionally substituted with one to three members selected from the group consisting of halogen, hydroxy, C_{1-18} alkoxy, amino and cyano groups; R_3 is selected from the group consisting of hydrogen, lower alkyl, hydroxy C_{1-18} alkyl, halogen, hydroxy, C_{1-18} alkoxy, lower acyloxy, arylcarbonyloxy in which the aryl group is a monocyclic or bicyclic group having from 6 to 10 carbon atoms in the ring portion, formyl, lower acyl, cyano, amino, carboxy and trifluoromethyl groups; R_4 and R_5 each independently is a member selected from the group consisting of lower alkyl, hydroxy C_{1-18} alkyl, halogen, hydroxy, C_{1-18} alkoxy, lower acyloxy, arylcarbonyloxy in which the aryl group is a monocyclic or bicyclic group having from 6 to 10 carbon atoms in the ring portion, formyl, lower acyl, cyano, amino, carboxy and trifluoromethyl groups; and R_6 and R_7 each independently is a member selected from the group consisting of hydrogen, amino, lower alkyl, hydroxy, nitro and cyano groups; or a pharmaceutically acceptable salt or a pharmaceutically acceptable ester thereof, with the proviso that said ester is formed only when one or more hydroxy groups are present on one or more of groups R_2, R_3, R_4, R_5, R_6, and R_7.

5,151,421
(1H-AZOL-1-YLMETHYL) SUBSTITUTED QUINOXALINE DERIVATIVES

Marc G. Venet, Paris; Gerard C. Sanz, Garges les Gonesse, both of France; Alfons H. M. Raeymaekers, Beerse, and Eddy J. E. Freyne, Rumst, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

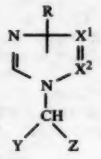
Division of Ser. No. 434,957, Nov. 13, 1989, Pat. No. 5,028,606. This application Mar. 20, 1991, Ser. No. 672,298

Claims priority, application United Kingdom, Nov. 29, 1988, 8827822

Int. Cl.[5] **A01N** *43/58, 43/40, 43/82;* **C07D** *241/36*

U.S. Cl. 514—249 **6 Claims**

1. A method of treating mammals suffering from disorders which are characterized by an increased proliferation or an abnormal differentiation of epithelial cells, which method comprises the systemic or topical administration to said mammals of an effective amount of a compound of the formula:



(I)

a pharmaceutically acceptable acid addition salt thereof, and a stereochemically isomeric form thereof, wherein:

$-X^1=X^2-$ represents a bivalent radical of the formula:

$-CH=CH-$ (x),

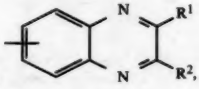
$-CH=N-$ (y), or

$-N=CH-$ (z);

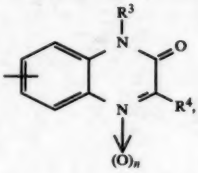
R represents hydrogen or C_{1-6}alkyl;

Y represents hydrogen, C_{1-10}alkyl, C_{3-7}cycloalkyl, Ar^1, Ar^2C_{1-6}alkyl, C_{2-6}alkenyl, or C_{2-6}alkynyl; and

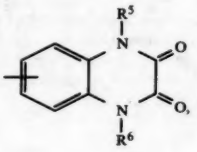
Z represents a radical of the formula:



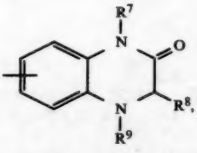
(a-1)



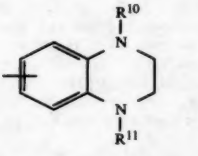
(a-2)



(a-3)



(a-4)



(a-5)

wherein:

R^1 represents hydrogen, halo, C_{1-6}alkyl, C_{1-6}alkyloxy, amino, mono- or di(C_{1-6}alkyl)amino, Ar^2, or imidazolyl;

R^2 represents hydrogen, C_{1-6}alkyl or Ar^1;

R^3 and R^7 each independently represent hydrogen, C_{1-6}alkyl, Ar^2C_{1-6}alkyl, amino, or mono(C_{1-6}alkyl)amino;
R^4 and R^8 each independently represent hydrogen, C_{1-6}alkyl, Ar^1, C_{1-6}alkylcarbonyl, Ar^2carbonyl, C_{1-6}alkyloxycarbonyl, carboxyl, C_{1-6}alkyloxycarbonylC_{1-4}alkyl, aminocarbonyl, or cyano;
R^5, R^6, R^9, R^{10}, and R^{11} each independently represent hydrogen, C_{1-6}alkyl, or Ar^2C_{1-6}alkyl; and
n represents 0 or 1;
wherein in the foregoing Ar^1 represents phenyl, substituted phenyl, naphthalenyl, pyridinyl, imidazolyl, triazolyl, thienyl, furanyl, or thiazolyl, and Ar^2 represents phenyl or substituted phenyl; wherein said substituted phenyl in Ar^1 or Ar^2 is phenyl substituted with 1, 2, or 3 substituents each independently selected from the group consisting of halo, hydroxy, trifluoromethyl, C_{1-6}alkyl, C_{1-6}alkyloxy, cyano, amino, mono- and di(C_{1-6}alkyl)amino, nitro, carboxyl, formyl, and C_{1-6}alkyloxy-carbonyl.

5,151,422

Patent Not Issued For This Number

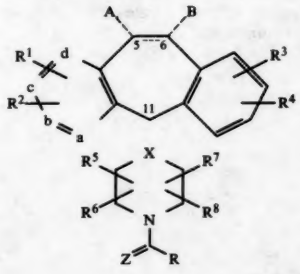
5,151,423

HETEROCYCLIC N-OXIDE DERIVATIVES OF SUBSTITUTED BENZO[5,6]CYCLOHEPTAPYRIDINES, COMPOSITIONS AND METHODS OF USE

John J. Piwinski, Parsippany; Michael J. Green, Skillman, and Jesse Wong, Union, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 345,604, May 1, 1989, Pat. No. 5,089,496. This application Dec. 10, 1990, Ser. No. 625,261
Claims priority, application European Pat. Off., Apr. 30, 1990, 90108225.5
Int. Cl.[5] A61K *31/495, 31/50;* **C07D** *401/04, 221/06*
U.S. Cl. 514—254 **31 Claims**

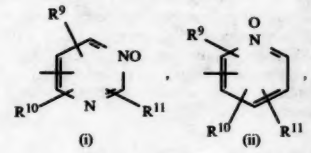
1. A compound having the structural formula



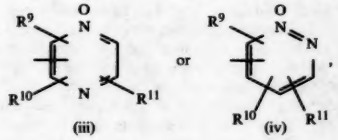
I

or a pharmaceutically acceptable salt or solvate thereof, wherein:

R represents an N-oxide heterocyclic group of the formula (i), (ii), (iii) or (iv)



(i) (ii)



(iii) (iv)

or R represents an alkyl group substituted with a heterocyclic N-oxide group of the formula (i), (ii), (iii) or (iv) above;
one of a, b, c and d represents N or NR^{12} where R^{12} is O, $—CH_3$ or $—(CH_2)_nCO_2H$ where n is 1 to 3, and the remaining a, b, c and d groups are CH, which remaining a, b, c and d groups optionally may be substituted with R^1 or R^2;
R^1 and R^2 may be the same or different and each independently represents halo, $—CF_3$, $—OR^{13}$, $—COR^{13}$, $—SR^{13}$, $—S(O)_eR^{14}$ where e is 1 or 2, $—N(R^{13})_2$, $—NO_2$, $—OC(O)R^{13}$, $—CO_2R^{13}$, $—OCO_2R^{14}$, —CN, $—NR^{13}OC(O)R^{13}$, alkynyl, alkenyl or alkyl, which alkyl group may be substituted with halo, $—OR^{13}$ or $—CO_2R^{13}$ and which alkenyl group may be substituted with halo, $—OR^{14}$ or $—CO_2R^{13}$;
R^3 and R^4 may be the same or different and each independently represents H or any of the substituents of R^1 and R^2, or R^3 and R^4 together may represent a saturated or unsaturated C_5–C_7 carbocyclic ring fused to the benzene ring;
R^5, R^6, R^7 and R^8 each independently represent H, $—CF_3$, alkyl or aryl, which alkyl or aryl may be substituted with $—OR^{13}$, $—SR^{13}$, or $—N(R^{13})_2$;
in addition, R^5 may be combined with R^6 to represent =O or =S and/or R^7 may be combined with R^8 to represent =O or =S;
R^9, R^{10}, and R^{11} may be the same or different and each is independently selected from H, halo, $—CF_3$, $—OR^{13}$, $—C(O)R^{13}$, $—SR^{13}$, $—S(O)_eR^{14}$ where e is 1 or 2, $—N(R^{13})_2$, $—NO_2$, $—CO_2R^{13}$, $—OCO_2R^{14}$, $—OCOR^{13}$, alkyl, aryl, alkenyl or alkynyl, which alkyl or alkenyl may be substituted with $—OR^{13}$, $—SR^{13}$ or $—N(R^{13})_2$ and which alkenyl may be substituted with OR^{14} or SR^{14};
R^{13} represents H, alkyl or aryl;

R^{14} represents alkyl or aryl;
R^{15} represents H or alkyl;
X represents N, CH or C;
when X represents C, an optional double bond indicated by the dotted lines to carbon atom 11 is present, and when X is N or CH, the double bond is absent;
the dotted line between carbon atoms 5 and 6 represents an optional double bond, such that when a double bond is present, A and B each independently represent $—R^{13}$, halo, $—OR^{14}$, $—OC(O)R^{13}$ or $—OCO_2R^{14}$ and when no double bond is present between carbon atoms 5 and 6, A and B each independently represent H_2, $—(OR^{14})_2$, [H and halo], dihalo, [alkyl and H], $(alkyl)_2$, [—H and $—OC(O)R^{13}$], [H and $—OR^{13}$], =O, [aryl and H], $=NOR^{15}$ or $—O—(CH_2)_p—O—$ where p is 2, 3 or 4 and R^{13} is as previously defined;
Z represents =O or =S;
alkyl as used herein represents a straight and branched carbon chain containing from one to twenty carbon atoms;
alkenyl as used herein represents a straight and branched carbon chain having at least one carbon to carbon double bond and containing from 2 to 12 carbon atoms;
alkynyl as used herein represents a straight and branched carbon chain having at least one carbon to carbon triple bond and containing from 2 to 12 carbon atoms; and
aryl as used herein represents a carbocyclic group containing from 6 to 15 carbon atoms and having at least one phenyl or fused phenylene ring, with all available substitutable carbon atoms of the carbocyclic group being intended as possible points of attachment, said carbocyclic group being optionally substituted with one or more of halo, alkyl, hydroxy, alkoxy, phenoxy, CF_3, amino, alkylamino, dialkylamino, $—COOR^{15}$ or $—NO_2$.

5,151,424

PHARMACOLOGICALLY ACTIVE (BICYCLIC HETEROCYCLYL)METHYL AND -HETERO) SUBSTITUTED HEXAHYDRO-1H-AZEPINES AND PYRROLIDINES

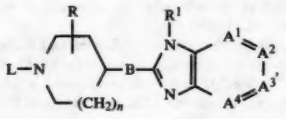
Frans E. Janssens, Bonheiden; Gaston S. M. Diels, Ravels, and Geert M. E. Pille, Edegem, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 609,989, Nov. 6, 1990, Pat. No. 5,071,846, which is a division of Ser. No. 338,440, Apr. 13, 1989, Pat. No. 4,988,689, which is a continuation of Ser. No. 198,960, May 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 68,515, Jul. 1, 1987, abandoned. This application Sep. 9, 1991, Ser. No. 756,673

Int. Cl.[5] A61K *31/505;* **C07D** *471/04*

U.S. Cl. 514—258 **21 Claims**

1. A compound of the formula:


(I)

a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof, wherein:
$—A^1=A^2—A^3=A^4—$ represents a bivalent radical of the formula:

$—CH=CH—CH=CH—$, (a-1)

$—N=CH—CH=CH—$, (a-2)

$—CH=N—CH=CH—$, (a-3)

$—CH=CH—N=CH—$, (a-4)

$—CH=CH—CH=N—$, (a-5)

-continued

$—N=CH—N=CH—$, (a-6)

or

$—CH=N—CH=N—$, (a-7)

wherein one or two hydrogen atoms in said radicals (a-1)–(a-7) may, each independently from each other, be replaced by halo, C_{1-6}alkyl, C_{1-6}alkyloxy, trifluoromethyl, or hydroxy;
R^1 represents hydrogen, C_{1-10}alkyl, C_{3-6}cycloalkyl, Ar^1 or C_{1-6}alkyl substituted with one or two Ar^1 radicals;
B represents NR^2, CH_2, O, S, SO, or SO_2, wherein R^2 represents hydrogen, C_{1-6}alkyl, C_{3-6}cycloalkyl, C_{1-6}alkylcarbonyl, C_{1-6}alkyloxycarbonyl, or Ar^2C_{1-6}alkyl;
R represents hydrogen or C_{1-6}alkyl;
n represents 0 or 2; and
L represents a group of the formula:

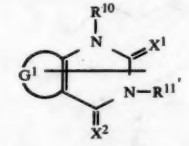
$—Alk—R^3$; (b-1)

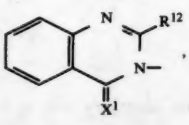
$—Alk—Y—R^4$; (b-2)

or

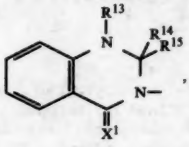
$—Alk—Z^1—(C=X)—Z^2—R^5$, (b-3)

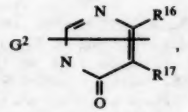
wherein:
R^3, R^4, and R^5 individually represent Het;
Y represents O, S, or NR^7, wherein R^7 represents hydrogen, C_{1-6}alkyl, C_{1-6}alkylcarbonyl, or Ar^1carbonyl;
Z^1 and Z^2 each independently represent O, S, NR^8, or a direct bond, wherein R^8 represents hydrogen or C_{1-6}alkyl;
X represents O, S or NR^9, wherein R^9 represents hydrogen, C_{1-6}alkyl, or cyano; and
each Alk independently represents C_{1-6}alkanediyl;
wherein in the foregoing:
Het represents a member selected from the group consisting of indolyl which is optionally substituted with C_{1-6}alkyl; quinolinyl which is optionally substituted with C_{1-6}alkyl; quinazolinyl which is optionally substituted with C_{1-6}alkyl; phthalazinyl which is optionally substituted with halo; 1,3-dioxo-1H-isoindol-2(3H)-yl; 2,3-dihydro-3-oxo-4H-benzoxazinyl and 2,3-dihydro-1,4-benzodioxinyl both being optionally substituted with C_{1-6}alkyl or halo; and 2-oxo-2H-1-benzopyranyl and 4-oxo-4H-1-benzopyranyl both being optionally substituted with C_{1-6}alkyl;
or Het represents a radical selected from the group of radicals of the formulas:

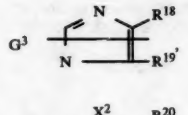

(c-1)

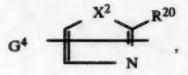

(c-2)

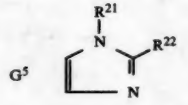
-continued



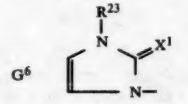








and



wherein:

X^1 and X^2 are each independently O or S;

R^{10}, R^{11}, R^{13}, R^{21} and R^{23} are each independently hydrogen, C_{1-6}alkyl, Ar^2C_{1-6}alkyl, hydroxyC_{1-6}alkyl, or C_{1-6}alkyloxycarbonyl;

R^{12}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19}, R^{20} and R^{22} are each independently hydrogen, C_{1-6}alkyl, hydroxy, mercapto, C_{1-6}alkyloxy, C_{1-6}alkylthio, halo and (C_{1-6}alkyloxycarbonyl)C_{1-6}alkyl;

G^1, G^3, G^4, G^5, and G^6 are —CH=CH—CH=CH—; and

G^2 is —CH=CH—CH=CH— or $-(CH_2)_4-$;

wherein one or two hydrogen atoms in said radicals G^1, G^2, G^3, G^4, G^5, and G^6 or in the benzene part of the radicals of formula (c-2) or (c-3) may be replaced by C_{1-6}alkyl, C_{1-6}alkylthio, C_{1-6}alkyloxy or halo;

Ar^1 represents a member selected from the group consisting of phenyl which may optionally be substituted with 1, 2, or 3 substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, C_{1-6}alkyl, C_{1-6}alkyloxy, C_{1-6}alkylthio, mercapto, amino, mono- and di(C_{1-6}alkyl)amino, carboxyl, C_{1-6}alkyloxycarbonyl, and C_{1-6}alkylcarbonyl; thienyl; halothienyl; furanyl; C_{1-6}alkyl substituted furanyl; pyridinyl; pyrimidinyl; pyrazinyl; thiazolyl; and imidazolyl optionally substituted with C_{1-6}alkyl; and

Ar^2 represents a member selected from the group consisting of phenyl which may optionally be substituted with 1, 2, or 3 substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, C_{1-6}alkyl, C_{1-6}alkyloxy, C_{1-6}alkylthio, mercapto, amino, mono- and di(C_{1-6}alkyl)amino, carboxyl, C_{1-6}alkyloxycarbonyl, and C_{1-6}alkylcarbonyl.

5,151,425

METHOD OF AND COMPOSITION FOR TREATING INFLAMMATION AND THE IMMUNOLOGICAL RESPONSE THERETO

(c-4) **LeaLand L. Clark, 1025 S. 1200 East, Salt Lake City, Utah 84105**

Filed Jun. 20, 1991, Ser. No. 718,362
Int. Cl.[5] A01N *43/90*
U.S. Cl. 514—261 **6 Claims**

(c-5) 1. A method for treating atopic dermatitis and the immunological response thereto comprising administering to a patient in need of such treatment an effective amount of 6-benzyl adenine in a compatible pharmaceutical preparation.

(c-6)

5,151,426

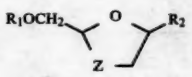
2-SUBSTITUTED-5-SUBSTITUTED-1,3-OXATHIOLANES WITH ANTIVIRAL PROPERTIES

(c-7) **Bernard Belleau, Westmount, and Nghe Nguyen-Ba, Brossard, both of Canada, assignors to BioChem Pharma Inc., Laval, Canada**

Division of Ser. No. 308,101, Feb. 8, 1989, Pat. No. 5,047,407.
This application Jun. 17, 1991, Ser. No. 716,627
Int. Cl.[5] C07D *239/02, 473/00, 495/00;* **A61K** *31/52, 31/505*
U.S. Cl. 514—262 **10 Claims**

1. A 1,3-oxathiolane of formula (A), the geometric and optical isomers thereof, and mixtures of those isomers:

(c-8)



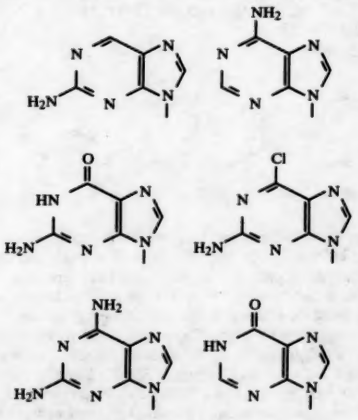
(A)

wherein:

Z is selected from a group consisting of sulfur, sulfoxide, and sulfone;

R_1 is selected from a group consisting of hydrogen, and an acyl group having 1 to 16 carbon atoms; and

R_2 is a heterocyclic radical selected from a group consisting of:

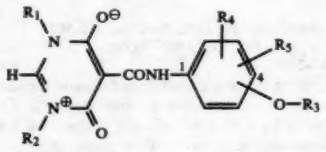


5,151,427
ANTHELMINITICS

Louis-Pierre Molleyres, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

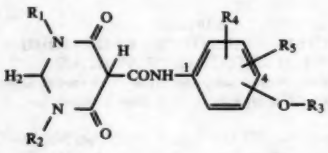
Filed Nov. 28, 1990, Ser. No. 619,272
Claims priority, application Switzerland, Dec. 1, 1989, 4297/89
Int. Cl.[5] A61K *31/505*; C07D *239/545*
U.S. Cl. 514—269 17 Claims

1. A compound of the general formula I



(I)

or in its hydrogenated form the formula (Ia)



(Ia)

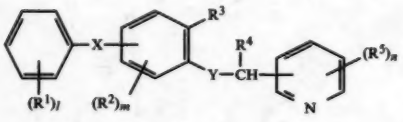
in which R_1 and R_2 independently of one another are C_1–C_6alkyl, allyl, C_3–C_6cycloalkyl, benzyl or phenyl; R_3 is unsubstituted or substituted pyridyl or quinolyl and R_4 and R_5 independently of one another are hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy or halogeno-C_1–C_3alkyl, including its tautomeric forms and physiologically tolerable salts.

5,151,428
PYRIDINE DERIVATIVES AND THEIR COMPOSITIONS FOR THE CONTROL OF INSECT PESTS

Noriyasu Sakamoto, 4-1-404, Ryodo-cho, Nishinomiya, Hyogo; Hirosi Kisida, 2-1-12-402, Nigawatakamaru, Takarazuka, Hyogo; Hiroaki Fujimoto, 2-11-7-407, Sonehigashiono-cho, Toyonaka, Osaka; Kimitoshi Umeda, 2-11-8-307, Sonehigashino-cho, Toyonaka, Osaka, and Noritada Matsuo, 29-2, Minaminoazzayamamichi, Itami, Hyogo, all of Japan

Filed May 24, 1991, Ser. No. 705,383
Claims priority, application Japan, May 24, 1990, 2-136497
Int. Cl.[5] A01N *43/40*; C07D *213/02*
U.S. Cl. 514—277 24 Claims

1. A pyridine derivative of the formula:



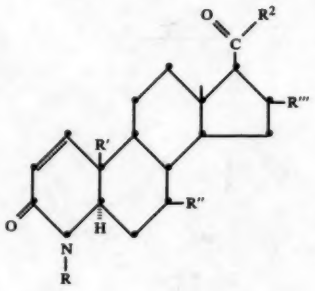
wherein R^1 is, the same or different, each a hydrogen atom, a halogen atom, a C_1–C_4 alkyl group, a C_1–C_4 haloalkyl group, a C_1–C_3 alkoxy group, a C_1–C_3 haloalkoxy group, a cyano group or a nitro group; R^2 is, the same or different, each a hydrogen atom, a halogen atom or a methyl group; R^3 is a halogen atom or a C_1–C_3 alkyl group; R_4 is a hydrogen atom or a C_1–C_3 alkyl group; R^5 is, the same or different, each a halogen atom, a C_1–C_3 alkyl group, a C_1–C_3 haloalkyl group, a C_1–C_3 alkoxy group or a C_1–C_3 haloalkoxy group; X is an oxygen atom, a sulfur atom, a carbonyl group, a sulfinyl group, a sulfonyl group, an imino group or a methylene group; Y is an oxygen atom or a sulfur atom; l is an integer of 1 to 5; m is an integer of 1 to 3; and n is an integer of 1 to 4.

5,151,429
17β-ACYL-4-AZA-5α-ANDROST-1-ENE-3-ONES AS 5α REDUCTASE INHIBITORS

Gary H. Rasmusson, Watchung, and Glenn F. Reynolds, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 630,357, Dec. 18, 1990, abandoned, which is a continuation of Ser. No. 363,567, Jun. 8, 1989, abandoned, which is a continuation of Ser. No. 129,335, Dec. 3, 1987, Pat. No. 4,859,681, which is a continuation of Ser. No. 800,624, Nov. 21, 1985, abandoned, which is a continuation of Ser. No. 584,061, Feb. 27, 1984, abandoned. This application Sep. 23, 1991, Ser. No. 764,047
Int. Cl.[5] A61K *31/58*; C07J *73/00*
U.S. Cl. 514—284 6 Claims

1. A compound of formula:



I

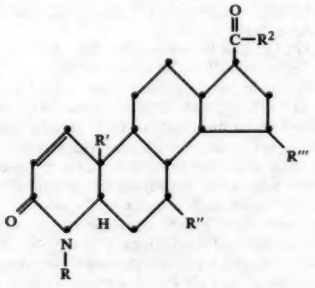
wherein

R is selected from hydrogen, methyl and ethyl; and

R^2 is a monovalent radical selected from benzyl and phenethyl or heterocyclic selected from 2- or 4-pyridyl, 2-pyrrolyl, 2-furyl or thiophenyl, and

R′, R″, R‴ are each selected from hydrogen or methyl.

5. A method of inhibiting testosterone 5α-reductase in a patient in need of such inhibiting treatment, comprising administration to such a patient of a therapeutically effective amount of a compound of the formula:



wherein

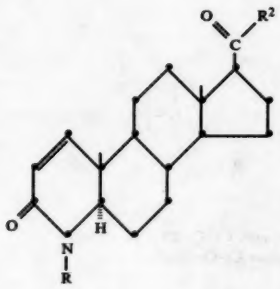
R and R^2 are defined as in claim 1,

R′ is hydrogen or methyl,

R″ is hydrogen of β-methyl,

R‴ is hydrogen, α-methyl or β-methyl.

6. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound of formula:



wherein R and R^2 are defined as in claim 1.

5,151,430

SPECIFIC 17β-THIOBENZOYL-4-AZA-5α-ANDROST-1-EN-3-ONES AS ANTIANDROGEN AGENTS

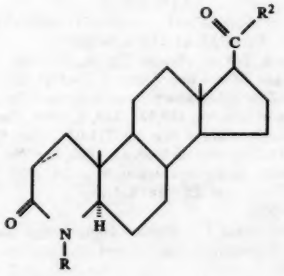
Nathan G. Steinberg, Clark; Gary H. Rasmusson, Watchung, and Thomas N. Salzmann, No. Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 540,965, Jun. 20, 1990, abandoned. This application Aug. 16, 1991, Ser. No. 745,659

Int. Cl.[5] A61K *31/58*; C07J *73/00*

U.S. Cl. 514—284 **6 Claims**

1. A compound of formula:



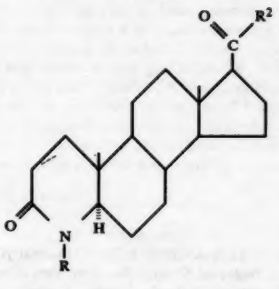
I

wherein

R is selected from hydrogen, methyl and ethyl and

R^2 is phenyl substituted with one or more of: —SC_1–C_4 alkyl, —SOC_1–C_4 alkyl, —SO_2C_1–C_4 alkyl, —SO_2N(C_1–C_4-alkyl)$_2$, C_1–C_4 alkyl, —$(CH_2)_mSH$, —S—$(CH_2)_n$—O—$COCH_3$, where m is 1–4, n is 1–3, providing C_1–C_4 alkyl is only present when one of the above sulfur-containing radicals is present, wherein the dotted line can represent a double bond, and pharmaceutically acceptable esters and salts thereof.

4. A method of treating the hyperandrogenic condition of acne vulgaris, seborrhea, female hirsutism, and benign prostatic hypertrophy comprising parenteral administration to a patient in need of such treatment of a therapeutically effective amount of a compound of formula:



I

wherein

R is selected from hydrogen, methyl and ethyl, and

R^2 is phenyl substituted with one or more of: —SC_1–C_4 alkyl, —SOC_1–C_4 alkyl, —SO_2C_1–C_4 alkyl, —SO_2N(C_1–C_4-alkyl)$_2$, C_1–C_4 alkyl, —$(CH_2)_mSH$, —S—$(CH_2)_n$—$OCOCH_3$, where m is 1–4, n is 1–3, providing C_1–C_4 alkyl is only present when one of the above sulfur-containing radicals is present, wherein the dotted line can represent a double bond, and pharmaceutically acceptable esters and salts thereof.

5,151,431

4,5-DIHYDRO-6H-IMIDAZO[4,5,1-IJ]QUINOLIN-6-ONE-6-OXIME-O-SULFONIC ACID DERIVATIVES USEFUL FOR TREATING HYPERTENSION OR EDEMA

Hitoshi Inaba; Kazumi Nishijima; Kazuo Kato; Ichiro Yamamoto; Ei Mochida, all of Shinjuku, and Kikuo Ohtomo, Kita, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd. and Hodogaya Chemical Co., Ltd., both of Tokyo, Japan

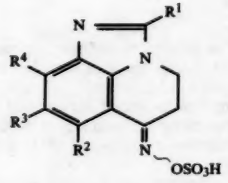
Filed Jun. 20, 1990, Ser. No. 540,950

Claims priority, application Japan, Jun. 26, 1989, 1-163190

Int. Cl.[5] C07D *471/04*; A61K *31/44*

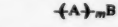
U.S. Cl. 514—292 **30 Claims**

1. A 4,5-dihydro-6H-imidazo[4,5,1-ij]quinolin-6-one-6-oxime-O-sulfonic acid compound represented by the formula (I):



(I)

wherein R^1 represents



wherein A represents an alkylene of straight or branched chain having 1 to 10 carbon atoms, an alkenylene of straight or branched chain having 2 to 10 carbon atoms, B represents a hydrogen atom, a hydroxy group, a cycloalkyl or cycloalkenyl group having 3 to 8 carbon atoms, a phenyl group, a phenoxy group, a naphthyl group or a mono- or fused- heterocyclic group selected from the group consisting of furyl, tetrahydropyranyl, quinolinyl, indolyl, pyridyl, and thienyl; any one of which is unsubstituted or substituted with one or more substituents which are identical or different and selected from a group consisting of a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a nitro group and an alkylamino group having 1 to 4 carbon atoms, m represents 0 or an integer of 1 and R^2, R^3 and R^4 are

identical or different and represent hydrogen atoms, halogen atoms, hydroxy groups, alkyl groups having 1 to 4 carbon atoms, alkoxy groups having 1 to 4 carbon atoms, or halogenated alkyl groups having 1 to 4 carbon atoms, provided that at least one of R^2, R^3 and R^4 represents a hydrogen atom, and that two adjacent groups of R^2, R^3 and R^4 are not groups at the same time selected from a group consisting of branched alkyl groups, branched alkoxy groups and branched halogenated alkyl groups, and the bond shown with a wavy line represents a bond of E-form or Z-form, or a salt or a solvate or a solvate of said salt thereof.

5,151,432

SUBSTITUTED AMINO ACID COMPOUNDS

Michel Vincent, Bagneux; Georges Remond, Versailles; Bernard Portevin, Elancourt; Yolande Herve, Puteaux, and Jean Lepagnol, Chatou, all of France, assignors to Adir et Compagnie, Courbevoie, France

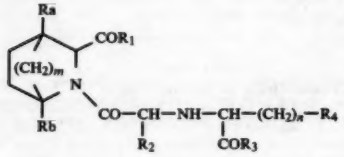
Filed Dec. 19, 1990, Ser. No. 629,823

Claims priority, application France, Dec. 20, 1989, 89 16881

Int. Cl.[5] C07D *453/06*; A61K *37/02*

U.S. Cl. 514—299 **7 Claims**

1. A compound selected from those of formula (I):



(I)

in which:

R_1 represents linear or branched, lower or higher alkoxy, or amino unsubstituted or substituted with one or two linear or branched lower alkyl groups,

R_2 represents linear or branched lower alkyl unsubstituted or substituted with amino,

R_3 represents an amino group, a linear or branched, lower or higher alkoxy, or hydroxyl, with the proviso, however, that at least one amino group is present in R_1 or R_3,

R_4 represents hydrogen or phenyl,

m is equal to 1 or 2,

n is between 1 and 6, and

Ra and Rb, which may be identical or different, represent a hydrogen atom when m=1, or linear or branched lower alkyl or hydrogen when m=2,

the term lower indicating that the group so described comprise from 1 to 6 carbon atoms the term higher indicating that the group so described comprises 7 to 12 carbon atoms,

their enantiomers, diastereoisomers, and epimers, as well as their addition salts with a pharmaceutically-acceptable acid or base.

5,151,433

STABILIZED MEDICINAL SUBSTANCES, A PROCESS FOR THE PREPARATION THEREOF, AND STABLE MEDICINAL FORMULATIONS

Werner Fülbreth; Richard Leeb; Manfred Radau, all of Kelkheim, and Willi Stammberger, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

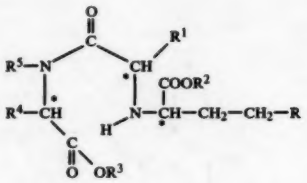
Filed Nov. 22, 1988, Ser. No. 274,598

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1987, 3739690

Int. Cl.[5] A61K *31/40, 31/47, 9/16*; C07K *5/06*

U.S. Cl. 514—299 **20 Claims**

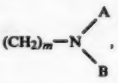
1. A stable pharmaceutical composition is compressed form containing a compound of the formula I



in which

R is hydrogen, C_1–C_4-alkyl or phenyl,

R^1 represents C_1–C_4-alkyl or



in which m is 1, 2, 3 or 4, and A and B are identical or different and denote hydrogen or C_1–C_4-alkyl,

R^2 is hydrogen, C_1–C_4-alkyl or benzyl,

R^3 is hydrogen or C_1–C_4-alkyl, and

R^4 and R^5 denote, together with the atoms carrying them, a heterocyclic, mono-, bi- or tricyclic hydrogenated or partially hydrogenated ring system which has one nitrogen atom and 4 to 15 ring carbon atoms and which is optionally mono- or disubstituted by C_1–C_4-alkoxy, or the physiologically tolerated salts thereof, which compound is in the form of an agglomerate and is stabilized with a polymeric protective coating, wherein the proportion by weight of the polymeric protective coating is 3 to 25% relative to said compound.

5,151,434

CONTROLLED-RELEASE COMPOSITION AND THE PREPARATION THEREOF

Tsutomu Irikura, Tokyo; Hirohsi Uchida, Saitama; Jun Imai, Kanagawa, and Masakatsu Komuro, Tochigi, all of Japan, assignors to Kyorin Seiyaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 143,225, Jan. 6, 1988, abandoned, which is a continuation of Ser. No. 711,031, Mar. 12, 1985, abandoned. This application Dec. 12, 1989, Ser. No. 448,889

Claims priority, application Japan, Mar. 14, 1984, 59-48441

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—300 **9 Claims**

1. A pharmaceutical composition comprising a blend of:

(a) a first component having a core of a pharmaceutically acceptable carrier and 3-isobutyryl-2-isopropylpyrazolopyridine and a first coating on said core capable of controllably releasing the 3-isobutyryl-2-isopropylpyrazolopyridine in the stomach and intestines; and

(b) a second component comprising a core of a pharmaceutically acceptable carrier and 3-isobutyryl-2-isopropylpyrazolopyridine, a first coating on said core capable of controllably releasing the 3-isobutyryl-2-isopropylpyrazolopyridine in the stomach and intestines, and a second enterosoluble coating on said first coating capable of controllably releasing the 3-isobutyryl-2-isopropylpyrazolo [1,5-a]pyridine only into the intestinal tract;

wherein the weight granule equivalent of said second component to said first component is from about 2:1 to 3:1 and the amount of 3-isobutyryl-2-isopropylpyrazolopyridine in the preparation is a vasodilating or bronchodilating effective amount.

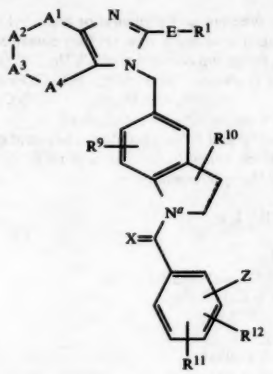
5,151,435

ANGIOTENSIN II ANTAGONISTS INCORPORATING AN INDOLE OR DIHYDROINDOLE

Scott Bagley, Rahway; William J. Greenlee, Teaneck; Duljit S. Dhanoa, Tinton Falls, and Arthur A. Patchett, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 8, 1991, Ser. No. 681,793
Int. Cl.[5] A61K *31/435*; C07D *470/04*
U.S. Cl. 514—303 10 Claims

1. A compound of structural formula I or a pharmaceutically acceptable salt



wherein:

R^1 is:

(a) $(C_1–C_6)$-alkyl, $(C_2–C_6)$-alkenyl or $(C_2–C_6)$-alkynyl each of which can be unsubstituted or substituted with a substituent selected from the group consisting of:
i) aryl as defined below in R^1(b),
ii) $(C_3–C_7)$-cycloalkyl,
iii) Cl, Br, I, F,
iv) OH,
v) NH_2,
vi) $NH(C_1–C_4)$-alkyl,
vii) $N[((C_1–C_4)\text{-alkyl})]_2$,
viii) $NHSO_2R^2$,
ix) CF_3,
x) $COOR^2$, or
xi) SO_2NHR^{2a};

(b) aryl, wherein aryl is defined as phenyl or naphthyl, unsubstituted or substituted with 1 or 2 substituents selected form the group consisting of:
i) Cl, Br, I, F,
ii) $(C_1–C_4)$-alkyl,
iii) $(C_1–C_4)$-alkoxy,
iv) NO_2
v) CF_3
vi) $SO_2NR^{2a}R^{2a}$,
vii) $(C_1–C_4)$-alkylthio,
viii) hydroxy,
ix) amino,
x) $(C_3–C_7)$-cycloalkyl, or
xi) $(C_3–C_{10})$-alkenyl,

(c) heteroaryl, wherein heteroaryl is defined as a 5- or 6-membered heteroaromatic moiety, which can contain one or two members selected from the group consisting of N, O, S and wherein the heteroaryl is optionally mono- or disubstituted with substituents selected from the group consisting of:
i) Cl, Br, I, F,
ii) OH,
iii) SH,
iv) NO_2,
v) $(C_1–C_4)$-alkyl,
vi) $(C_2–C_4)$-alkenyl,
vii) $(C_2–C_4)$-alkynyl,
viii) $(C_1–C_4)$-alkoxy, or
ix) CF_3,

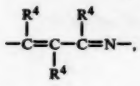
(d) $(C_1–C_4)$-perfluoroalkyl,

(e) $(C_3–C_8)$-cycloalkyl, or

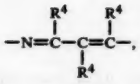
(f) $(C_1–C_4)$-alkyl-$(C_3–C_8)$-cycloalkyl;

$—A^1—A^2—A^3—A^4—$ is:

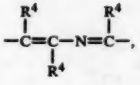
(a)



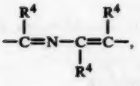
(b)



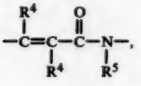
(c)



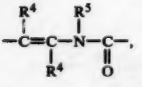
(d)



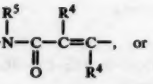
(e)



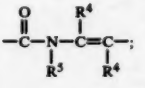
(f)



(g)



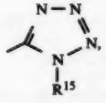
(h)



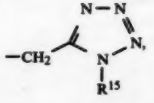
E is:

(a) a single bond,

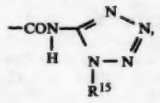
(b) —$S(O)_n(CH_2)_s$—, or
(c) —O—;
n is 0 to 2;
s is 0 to 5;
a is a single bond or absent;
X is
(a) O,
(b) H; H,
(c) H; CO_2-(C_1–C_4)-alkyl,
(d) H; CO_2H,
(e) H; CN,
(f) H; 1H-tetrazol-5-yl, or
(g) H; $CONHSO_2R^{14}$;
R^2 is:
(a) H, or
(b) (C_1–C_6)-alkyl;
R^{2a} is:
(a) R^2,
(b) CH_2-aryl
(c) aryl;
R^4 groups are independently:
(a) H,
(b) (C_1–C_6)-alkyl, (C_2–C_6)-alkenyl, or (C_2–C_6)-alkynyl, each of which is unsubstituted or substituted with:
i) OH,
ii) (C_1–C_4)-alkoxy,
iii) CO_2R^2,
iv) $OCOR^2$,
v) $CONHR^2$,
vi) $CON(R^2)_2$,
vii) $N(R^2)C(=O)R^2$,
viii) NH_2,
ix) (C_1–C_4)-alkylamino,
x) di[(C_1–C_4)-alkyl]amino,
xi) aryl,
xii) heteroaryl, wherein heteroaryl is as defined in R^1 (c),
(c) —C(=O)-aryl,
(d) (C_3–C_7)-cycloalkyl,
(e) Cl, Br, I, F,
(f) —OH,
(g) $—OR^{21}$,
(h) $—CF_3$,
(i) —SH,
(j) —$S(O)_n$—(C_1–C_4)-alkyl,
(k) $—CO_2R^{2a}$,
(l) $—SO_3H$,
(m) $—NR^2R^{21}$,
(n) $—NR^2C(=O)R^{21}$,
(o) $—NR^2COOR^{21}$,
(p) $—SO_2NHR^{21}$,
(q) $—SO_2NR^2R^{2a}$,
(r) $—NO_2$,
(s) —$NHSO_2$—(C_1–C_4)—alkyl,
(t) $—C(O)NHSO_2R^{14}$,
(u) aryl,
(v) heteroaryl, wherein heteroaryl is as defined in R^1 (c), or
(w) morpholin-4-yl;
R^5 is:
(a) H, or
(b) (C_1–C_6)-alkyl or (C_2–C_6)-alkenyl, unsubstituted or substituted with:
i) hydroxy, or
ii) (C_1–C_4)-alkoxy;
R^9 and R^{10} are each independently:
(a) H,
(b) Cl, Br, I, F,
(c) NO_2,
(d) (C_1–C_6)-alkyl,
(e) (C_1–C_6)-acyloxy,
(f) (C_3–C_6)-cycloalkyl,
(g) (C_1–C_6)-alkoxy,
(h) $—NHSO_2R^{2a}$,
(i) hydroxy-(C_1–C_4)-alkyl,
(j) aryl-(C_1–C_4)-alkyl,
(k) (C_1–C_4)-alkylthio,
(l) (C_1–C_4)-alkylsulfinyl,
(m) (C_1–C_4)-alkylsulfonyl,
(n) NH_2,
(o) NH[(C_1–C_4)-alkyl],
(p) $N[(C_1–C_4)\text{-alkyl}]_2$,
(q) CF_3,
(r) $—SO_2—NHR^{2a}$,
(s) furyl, or
(t) aryl, wherein aryl is phenyl or naphthyl unsubstituted or substituted with one or two substituents selected from the group consisting of: Cl, Br, I, F, (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, NO_2, CF_3, (C_1–C_4)-alkylthio, OH, NH_2, —NH[(C_1–C_4)-alkyl], $—N[(C_1–C_4)\text{-alkyl}]_2$, $—CO_2H$, or $—CO_2$—(C_1–C_4)-alkyl;
(u) when R^9 and R^{10} are bonded to adjacent carbon atoms, they can be joined to form an aryl ring;
R^{11} and R^{12} are independently:
(a) H,
(b) Cl, Br, I, F,
(c) NO_2,
(d) NH_2,
(e) NH[(C_1–C_4)-alkyl],
(f) $N[(C_1–C_4)\text{-alkyl}]_2$,
(g) SO_2NHR^{2a},
(h) CF_3,
(i) (C_1–C_4)-alkyl,
(j) (C_1–C_4)-alkoxy, or
(k) when R^{11} and R^{12} are bonded to adjacent carbon atoms, they can be joined to form an aryl ring;
Z is:
(a) —H,
(b) $—CC_2R^{2a}$,
(c) $—SO_3R^{13}$,
(d) $—NHSO_2CF_3$,
(e) $—PO(OR^{13})_2$,
(f) $—SO_2NHR^{14}$,
(g) $—CONHOR^{13}$, or
(h) $—CR^{2a}(OH)PO(OR^{13})_2$;
(i) —CN,
(j) —SO_2NH-heteroaryl, wherein heteroaryl is as defined in R^1 (c) above,
(k) —CH_2SO_2NH-heteroaryl, wherein heteroaryl is as defined in R^1 (c) above,
(l) $—SO_2NH—CO—R^{14}$,
(m) $—CH_2SO_2NH—CO—R^{14}$,
(n) $—CONH—SO_2R^{14}$,
(o) $—CH_2CONH—SO_2R^{14}$,
(p) $—NHSO_2NHCO—R^{14}$,
(q) $—NHCONHSO_2—R^{14}$,
(r) $—NHCO_2R^{2a}$,
(s)



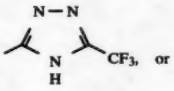
(t)



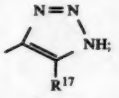
(u)



(v) —CONHNHSO$_2$CF$_3$,
(w)



(x)



R^{13} is H, or —CH(R^4)—O—C(O)R^4;
R^{14} is
(a) aryl,
(b) heteroaryl, wherein heteroaryl is as defined in R^1 (c),
(c) (C$_3$–C$_7$)-cycloalkyl,
(d) (C$_1$–C$_4$)-alkyl unsubstituted or substituted with a substituent selected from the group consisting of aryl, heteroaryl, wherein heteroaryl is as defined in R^1 (c), —OH, —SH, (C$_1$–C$_4$)-alkyl, —O(C$_1$–C$_4$)-alkyl, —S(C$_1$–C$_4$)-alkyl, —CF$_3$, Cl, Br, F, I, —NO$_2$, —CO$_2$H, CO$_2$(C$_1$–C$_4$)-alkyl, —NH$_2$, —NH[(C$_1$–C$_4$)-alkyl]$_2$, —PO$_3$H, PO(OH) (O-(C$_1$–C$_4$)-alkyl);
R^{15} is H, (C$_1$–C$_6$)-alkyl, (C$_2$–C$_4$)-alkenyl, (C$_1$–C$_4$)-alkoxy alkyl, or benzyl, wherein the phenyl is unsubstituted or substituted with a substituent selected from the group consisting of: —NO$_2$, —NH$_2$, —OH or —OCH$_3$;
R^{17} is —CN, —NO$_2$, —CO$_2$R^{2a}, or —CF$_3$; and
R^{21} is:
(a) H, or
(b) (C$_1$–C$_4$)-alkyl unsubstituted or substituted with:
i) NH$_2$,
ii) NH[(C$_1$–C$_4$)-alkyl],
iii) N[(C$_1$–C$_4$)-alkyl]$_2$,
iv) CO$_2$H,
v) CO$_2$(C$_1$–C$_4$)-alkyl,
vi) OH,
vii) SO$_3$H, or
viii) SO$_2$NH$_2$.

5,151,436

DERIVATIVES OF THIOFORMAMIDE

David C. Cook, London; Terance W. Hart, Brentwood; Iain M. Mc Lay, Loughton; Malcolm N. Palfreyman, Upminster; Brian W. Sharp, Hornchurch, and Roger J. A. Walsh, Rayleigh, all of England, assignors to Rhone-Poulenc Sante, Antony, France

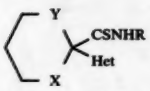
Continuation-in-part of Ser. No. 285,219, Dec. 16, 1988. This application Aug. 23, 1990, Ser. No. 571,101

Claims priority, application United Kingdom, Dec. 18, 1987, 8729521; Jun. 16, 1989, 8913865

Int. Cl.^{5} **A61K** *31/435, 31/47, 31/445;* **C07D** *215/06, 211/72, 211/84*

U.S. Cl. 514—314 **8 Claims**

1. A thioformamide derivative of the formula:



(I)

wherein R represents a straight- or branched-chain alkyl radical containing from 1 to 4 carbon atoms, Het represents a tetrahydroquinolin-3-yl, quinolin-3-yl, or pyrid-3-yl radical (optionally substituted by a straight- or branched-chain alkyl or alkoxy radical containing 1 to 4 carbon atoms or by a halogen atom), Y represents an ethylene or methylene radical, or a valency bond, and X represents a carbonyl or hydroxymethylene group or a group of the formula: >C=NOR^1, >C=NN(R^1)$_2$ or >C=NN(R^1)CON(R^1)$_2$ in which the symbols R^1, which may be the same or different, each represents a hydrogen atom or a straight- or branched-chain alkyl radical containing from 1 to 4 carbon atoms which is unsubstituted or substituted by one or more substituents selected from C$_{2-4}$-alkenyl, carboxy, C$_{2-5}$-alkoxycarbonyl, hydroxy, C$_{1-4}$-alkyl groups), amino, C$_{1-4}$-alkylamino and di-C$_{1-4}$-alkylamino groups or represents a benzyl, phenethyl, 1-naphthylmethyl, 2-naphthylmethyl or pyrid-3-ylmethyl radical each of which may be substituted on the ring by one or more halogen atoms or hydroxy, C$_{1-4}$-alkyl, C$_{1-4}$-alkoxy (alkoxy being unsubstituted or substituted as defined for alkyl groups represented by R^1), cyano, nitro, trifluoromethyl, carboxy, C$_{1-4}$-alkylamino, C$_{2-5}$-alkanoylamino, C$_{2-5}$-alkoxycarbonyl groups or two R^1 substituents on the same nitrogen atom may together form a straight- or branched-chain alkylene radical containing from 4 to 6 carbon atoms in the chain which is unsubstituted or substituted as defined for alkyl groups represented by R^1, or a pharmaceutically acceptable salt thereof.

5,151,437

BENZOFURANCARBOXAMIDES HAVING BASIC SUBSTITUENTS AND THERAPEUTIC AGENTS CONTAINING THE SAME

Rainer Schlecker, Bissersheim; Hans-Juergen Teschendorf, Dudenhofen, and Liliane Unger, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

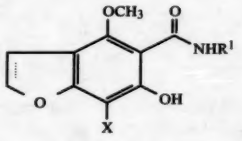
Continuation of Ser. No. 221,653, Jul. 20, 1988, abandoned. This application Oct. 15, 1990, Ser. No. 598,785

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724756

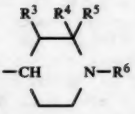
Int. Cl.^{5} **C07D** *207/09;* **A61K** *31/40*

U.S. Cl. 514—320 **13 Claims**

1. A benzofurancarboxamide of the formula:



X is hydrogen or methoxy,
R^1 is a radical of the formula:



wherein R^3 to R^5 are each, independently of one another, hydrogen or C$_{1-6}$ alkyl, R^6 is a branched or unbranched C$_{1-6}$

alkyl, or benzyl which may be methyl- or halogen-substituted on the nucleus, and — is a single or double bond.

5,151,438

RETROVIRAL PROTEASE INHIBITING COMPOUNDS

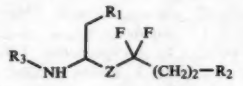
Hing L. Sham, Gurnee; Daniel W. Norbeck, Lindenhurst; Dale J. Kempf, Libertyville, and Chen Zhao, Gurnee, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 518,730, May 9, 1990, which is a continuation-in-part of Ser. No. 456,124, Dec. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 405,604, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 355,945, May 23, 1989, abandoned. This application Mar. 27, 1991, Ser. No. 675,780

Int. Cl.[5] C07D *213/40*; A61K *31/44*

U.S. Cl. 514—357 **13 Claims**

1. A compound of the formula:

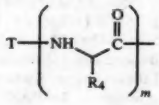


wherein

R_1 is loweralkyl, cycloalkyl, phenyl, substituted loweralkyl, substituted cycloalkyl or substituted phenyl wherein the loweralkyl, cycloalkyl or phenyl group is substituted with one or two substituents independently selected from hydroxy, alkoxy, thioalkoxy and halo;

R_2 is phenyl or substituted phenyl wherein the phenyl ring is substituted with one or two substituents independently selected from hydroxy, alkoxy, thioalkoxy and halo;

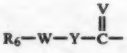
R_3 is



wherein

m is 2 and R_4 is independently selected at each occurrence from hydrogen, loweralkyl, cycloalkylalkyl, haloalkyl, hydroxyalkyl, alkoxyalkyl, thioalkoxyalkyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, carboxyalkyl, alkoxycarbonylalkyl and aminocarbonylalkyl and

T is



wherein

R_6 is pyridyl or substituted pyridyl wherein the pyridyl ring is substituted with one or two substituents independently selected from hydroxy, halo, amino, alkylamino, dialkylamino, alkoxy, polyalkoxy, haloalkyl, cycloalkyl, aryl, arylalkyl, —COOH, —SO_3H and loweralkyl, V is O or S, W is CH_2, —CH_2CH_2—, —CH=CH—or —D—CH=CH—wherein D is O, S or NH and Y is absent, O, S or $N(R_7)$ wherein R_7 is hydrogen or loweralkyl; and

Z is —C(O)—or —CH(OH)—; or a pharmaceutically acceptable salt thereof wherein the term alkyl as used herein refers to a straight or branched chain alkyl radical containing from 1 to 6 carbon atoms; wherein the terms alkoxy and thioalkoxy as used herein refer to R_{32} is an alkyl group or benzyl and wherein the term aryl as used herein refers to phenyl, naphthyl, tetrahydronaphthyl or indanyl.

5,151,439

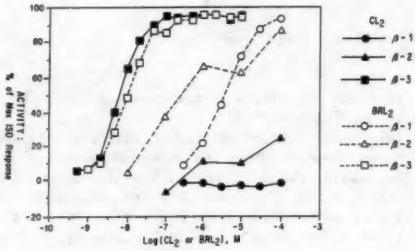
SUBSTITUTED 5-(2-((2-ARYL-2-HYDROXYETHYL)AMINO)PROPYL)-1,3-BENZODIOXOLES

Jonathan D. Bloom, Hartsdale, N.Y.; Thomas H. Claus, Montvale; Vern G. DeVries, Ridgewood, both of N.J.; Jo A. Dolan, Spring Valley, and Minu D. Dutia, West Nyack, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

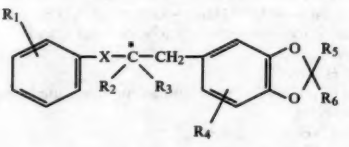
Division of Ser. No. 519,192, May 4, 1990, Pat. No. 5,061,727. This application Aug. 1, 1991, Ser. No. 742,409

Int. Cl.[5] A61K *31/42*

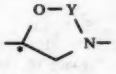
U.S. Cl. 514—376 **26 Claims**



1. A compound of the formula



wherein R_1 and R_4 may be one or more groups which may be the same or different and are selected from the group consisting of hydrogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, hydroxy, halogen, trifluoromethyl, carboxyl, hydroxyalkyl, alkoxycarbonyl, C_1 to C_4 thioalkyl, sulfonyl and sulfinyl; X is



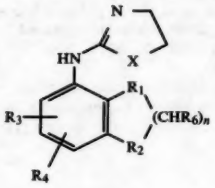
wherein Y is selected from the group consisting of carbonyl, and thiocarbony; R_2 and R_3 may be the same or different and are selected from the group consisting of hydrogen and C_1 to C_4 alkyl; R_5 and R_6 are selected from the group consisting of hydrogen, carboxy, alkoxycarbonyl, hydroxymethyl, —$CH_2OCH_2COOR_7$ and —$CH_2OCH_2CH_2OR_7$ where R_7 is hydrogen or C_1 to C_4 alkyl; except that R_5 and R_6 may not both be hydrogen; the asterisks denote asymmetric carbon atoms; or a pharmaceutically acceptable salt or ester thereof, the enantiomers thereof, the racemic mixtures thereof and the diastereomeric mixtures thereof.

5,151,440
METHOD FOR REDUCING OR MAINTAINING INTRAOCULAR PRESSURE IN THE MAMMALIAN EYE BY ADMINISTERING PHARMACEUTICAL COMPOSITIONS CONTAINING 2-(2-ALKYLPHENYLAMINO)-OXAZOLINES, 2-(2-ALKYLPHENYL-AMINO)-THIAZOLINES AND 2-(2-ALKYLPHENYLAMINO)-IMIDAZOLINES

Charles Gluchowski, Mission Viejo, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Feb. 28, 1990, Ser. No. 486,381
Int. Cl.[5] A61K *31/42*
U.S. Cl. 514—377 **13 Claims**

1. A method of treating animals of the mammalian species, including humans, for the purpose of reducing or maintaining intraocular pressure in the eye of the mammal, the method of treatment comprising the steps of administering to the mammal a pharmaceutical composition which comprises as its active ingredient one or more compounds of the formula



where X is O;

n is an integer with the values of 0, 1 or 2; R_3 and R_4 independently are H or lower alkyl having 1 to 6 carbons;

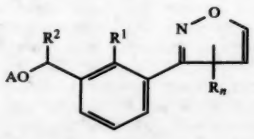
R_6 is H or lower alkyl of 1 to 6 carbons, with the proviso that when n is 0 then R_1 is lower alkyl having 1 to 6 carbon atoms and R_2 is H or lower alkyl having 1 to 6 carbon atoms, when n is 1 or 2, then R_1 and R_2 both are CHR_5, where R_5 independently is H or lower alkyl of 1 to 6 carbons, or salts of compounds of said formula the active ingredient being present in the pharmaceutical composition in approximately 0.0001 to 1.0 per cent weight by volume concentration.

5,151,441
3-ISOXAZOLYLBENZYL ESTERS, THEIR PREPARATION AND THEIR USE

Stefan Mueller, Speyer; Hans Theobald, Limburgerhof; Bernd Wolf, Fussgoenheim; Peter Hofmeister, Neustadt; Uwe Kardorff, Mannheim, and Christoph Kuenast, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

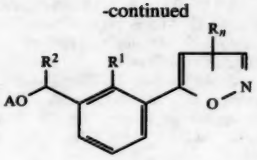
Filed May 14, 1991, Ser. No. 699,528
Claims priority, application Fed. Rep. of Germany, May 18, 1990, 4016049
Int. Cl.[5] A01N *43/80*; C07D *413/04, 261/06, 277/20*
U.S. Cl. 514—378 **7 Claims**

1. A 3-isoxazolylbenzyl ester of the formula Ia or Ib



Ia

-continued



Ib

where

R is halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_2–C_4-alkenyl or C_2–C_4-haloalkenyl or is phenylethyenyl which may carry from one to five halogen atoms, or is C_2–C_4-alkynyl, C_3–C_6-cycloalkyl, phenyl, naphthyl, phyrrolyl, pyrazolyl, imidazolyl, isoxazolyl, oxazolyl, isothiazolyl, thiazolyl, furanyl, thienyl or pyridyl, CO_2R^3 or $CONR^4R^5$,

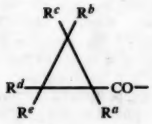
R^3, R^4 and R^5 are each hydrogen or C_1–C_6-alkyl,

n is 0, 1 or 2, and the radicals R may be different when n is 2,

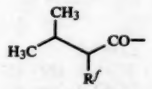
R^1 is halogen or C_1–C_4-alkyl,

R^2 is hydrogen, C_1–C_4-alkyl, C_2–C_4-alkenyl, C_2–C_4-alkynyl or cyano and

A is a carbonyl radical of the formula IIa or IIb



IIa



IIb

where

R^a is hydrogen, C_1–C_4-alkyl or phenyl, wherein the aromatic ring may carry from one to five halogen atoms and/or from one to three of the following radicals: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy or C_1–C_4-alkylthio, R^b—, R^c and R^d are each hydrogen, halogen or C_1–C_4-alkyl, R^e is hydrogen, halogen, C_1–C_4-alkyl or C_1–C_4-haloalkyl or is C_2–C_6-alkenyl or C_2–C_6-alkadienyl which may carry from one to eight halogen atoms and/or one of the following radicals: C_1–C_4-alkoxycarbonyl or phenyl, where the phenyl radical in turn may carry from one to five halogen atoms and/or from one to three of the following groups: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy or C_1–C_4-alkylthio, or R^e is C_3–C_7-cycloalkylidenemethy, or R^3 and R^3 together form a 2,2H-indenespiro group and R^f is phenyl, 1-pyrrolyl or 2-isoindolyl radical, where this ring system may carry from one following radicals: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy or C_4–C_4-alkylthio, or a phenylamino group where the phenyl ring in turn may carry from one to five halogen atoms and/or from one to three of the following radicals:

C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy or C_1–C_4-alkylthio.

5,151,442

CHROMAN DERIVATIVE ACTIVE ON THE CENTRAL NERVOUS SYSTEM, THEIR METHOD OF PREPARATION AND PHARMACEUTICAL COMPOSITIONS IN WHICH THEY ARE PRESENT

Georges Garcia; Alain Di Malta, both of Saint-Gely-du-Fesc, and Philippe Soubrie, St Mathieu de Treviers, all of France, assignors to Sanofi, Paris, France

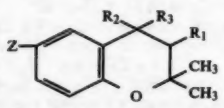
Division of Ser. No. 440,090, Nov. 22, 1989, Pat. No. 5,082,858. This application Oct. 23, 1991, Ser. No. 781,414

Claims priority, application France, Nov. 23, 1988, 88 15284

Int. Cl.[5] A61K *31/35;* **C07D** *311/68*

U.S. Cl. 514—456 **4 Claims**

1. A compound of the formula



(I)

in which:

Z represents a halogen or a cyano, acetyl, trifluoro-acetyl, nitro, C_1–C_4 alkylthio, carboxyl, phosphono, dialkoxy-phosphonyl or alkoxycarbonyl group, the alkylthio and alkoxy groups containing from 1 to 3 carbon atoms;

R_1 denotes a hydroxyl group and R_2 represents hydrogen, or R_1 and R_2 taken together form an additional bond between the carbon atoms by which they are carried; and

R_3 represents

a group —S—R_5, in which R_5 represents a C_1–C_4 alkyl group, a C_3–C_7 cycloalkyl or a phenyl group which is unsubstituted or monosubstituted or disubstituted by a halogen, a nitro group, a C_1–C_4 alkyl group, a trifluoro-methyl group, an amino group, a group —N—$(Alk)_2$, a group —COOAlk or a group —OAlk, Alk denoting a C_1–C_4 alkyl group; or R_5 denotes a group —Alk-N—$(Alk)_2$ in which Alk is as defined above; or

a group SO_2R_5, in which R_5 is as defined above;

or the salts which the compounds of formula (I) are capable of producing with pharmaceutically acceptable acids when the substituent R_3 comprises an amino group.

5,151,443

METHOD OF CONTROLLING TERMITES

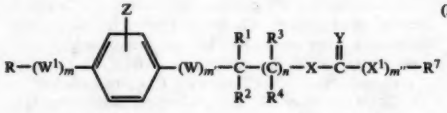
Clive A. Henrick, Palo Alto, Calif., assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 556,492, Jul. 20, 1990, abandoned. This application Jan. 16, 1992, Ser. No. 823,574

Int. Cl.[5] A01N *47/10*

U.S. Cl. 514—486 **6 Claims**

1. A method for controlling termites which comprises applying to the termites, their locus or a locus where protection against termite infestation is desired an effective amount of a compound of the following formula I



(I)

wherein

each of m, m′ and m″ is one;

n is zero, one, two or three;

R is hydrogen, lower alkenyl, lower alkynyl, lower halogenalkyl, lower haloalkenyl, lower haloalkynyl, lower alkoxyalkyl, lower alkylthioalkyl, cycloalkyl or cycloalkylalkyl;

each of R^1, R^2, R^3, R^4 and R^8 is independently hydrogen or lower alkyl;

R^7 is lower alkyl, lower alkenyl, lower alkynyl, lower haloalkyl, lower haloalkenyl, lower haloalkynyl, cycloalkyl or cycloalkylalkyl;

W is oxygen or sulfur;

W^1 is oxygen or sulfur;

X is NR^8;

X^1 is oxygen or sulfur;

Y is oxygen or sulfur; and

Z is hydrogen, lower alkyl, lower haloalkyl or halogen.

5,151,444

OCULAR HYPOTENSIVE AGENTS

Ryuzo Ueno; Ryuji Ueno, both of Nishinomiya, and Oda, Itami, all of Japan, assignors to K.K. Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

Continuation of Ser. No. 246,059, Sep. 19, 1988, Pat. No. 5,001,153. This application Sep. 19, 1990, Ser. No. 584,669

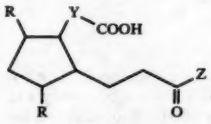
Claims priority, application Japan, Sep. 18, 1987, 62-235890; Dec. 29, 1987, 62-334037

The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.

Int. Cl.[5] A61K *31/557*

U.S. Cl. 514—530 **15 Claims**

1. A topical ocular composition comprising an amount effective as an ocular hypotensive agent of a 13,14-dihydro-15- keto prostaglandin represented by the formula (I):



wherein each R is independently hydroxy, hydroxy C_{1-3} alkyl or C_{1-2} alkyl; Y is a saturated or unsaturated C_{2-6} hydrocarbon chain which is unsubstituted or substituted by oxo, halogen, an alkyl group or hydroxyl; Z is a C_{1-10} saturated or unsaturated hydrocarbon forming a straight-chain, a branched-chain or a ring, which is unsubstituted or substituted by halogen, an alkyl group, an alkoxy group, hydroxyl, a phenyl group or a phenoxy group; or the physiologically acceptable slats and carboxylic acid esters, said ester being a straight or branched-chain alkyl containing up to one unsaturated bond, cycloakly, benzyl, phenyl, hydroxyalkyl, alkoxyalkyl, alkylsilyl or tetrahydropyranyl ester, of the compounds of formula (I); and a pharamaceutically acceptable carrier.

5,151,445

METHOD OF INHIBITING PARASITIC ACTIVITY

Joseph K. Welply, St. Peters; Steven P. Adams, St. Charles, and Jeffrey I. Gordon, Olivette, all of Mo., assignors to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 208,192, Jun. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 151,774, Feb. 3, 1988, abandoned. This application Jan. 8, 1991, Ser. No. 638,709

Int. Cl.[5] A61K *31/19*

U.S. Cl. 514—557 **6 Claims**

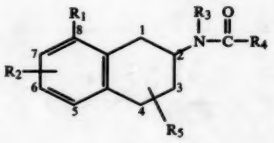
1. A method of inhibiting growth and viability of bloodstream trypanasome parasites having a GPI membrane anchor which comprises contacting said bloodstream trypanosome parasites with an oxy-substituted fatty acid analog selected from the group consisting of C_{13} and C_{14} fatty acids or alkyl esters thereof in which a methylene group normally in carbon position from 4 to 13 of said fatty acid is replaced with oxygen, whereby the myristate in said GPI membrane is replaced with said oxy-substituted fatty acid analog.

5,151,446
SUBSTITUTED 2-AMIDOTETRALINS AS MELATONIN AGONISTS AND ANTAGONISTS

Alan S. Horn, deceased, late of Noordhorn, Netherlands by Mark Horn, legal representative , and Margarita L. Dubocovich, Evanston, Ill., assignors to Northwestern University, Evanston, Ill.

Continuation-in-part of Ser. No. 411,675, Sep. 25, 1989, Pat. No. 5,071,875. This application Mar. 28, 1991, Ser. No. 676,873
Int. Cl.[5] A61K *31/165, 31/16*
U.S. Cl. 514—617 **7 Claims**

1. A method for treatment of disorders associated with abnormal melatonin activity in an organism, said method comprising the step of administering a therapeutically effective amount of a composition comprising a compound of the formula:



I

wherein:

R_1 is hydrogen, halogen, amino, amino, a C_{1-4} alkyl, C_{1-4} alkoxyl, or C_{1-4} alkoxyl-C_6-aryl;

R_2 is hydrogen, hydroxyl, halogen, amino, amido, C_6 aryl, mono- or di- C_{1-4} alkylamino, C_{1-4} alkyl-C_6-aryl, or C_{1-4}alkoxyl-C_6-aryl, or C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{2-6}alkoxyl;

R_3 is hydrogen, aryl, C_{1-4} alkyl-C_6-aryl or C_{1-4}alkyl, C_{2-4} alkenyl, or C_{1-4} alkynl;

R_4 is C_6 aryl, C_{1-4} alkyl-C_6-aryl, or C_{1-4} alkyl, halo-C_{1-4}-alkyl or C_{3-6}cycloalkyl;

R_5 is hydrogen, hydroxyl, halogen, oxo, C_6 aryl, C_{1-4} alkyl-aryl, or C_{1-4} alkyl;

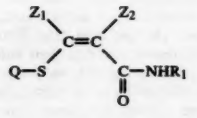
wherein aryl substituents of R_2, R_3, R_4, and R_5 may optionally be halogen, hydroxyl, amino, mono- or di-C_{1-4} alkyl or alkoxyl substituted.

5,151,447
S-SUBSTITUTED BETA-THIOACRYLAMIDE BIOCIDES AND FUNGICIDES

David R. Amick, Doylestown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 387,452, Jul. 28, 1989, abandoned. This application Jun. 5, 1990, Ser. No. 533,566
Int. Cl.[5] A01N *37/18*
U.S. Cl. 514—627 **2 Claims**

1. Method of controlling or inhibiting growth of bacteria in a locus comprising incorporating into or onto the locus a bacteriacidally effective amount of the compound of the formula

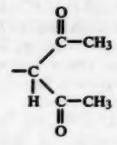


I

wherein

R_1 is selected from an unsubstituted or substituted phenyl, phenethyl and benzyl,

Q is



and Z_1 and Z_2 are independently selected from hydrogen, halogen and $(C_1–C_4)$alkyl.

5,151,448
METHOD FOR TREATING PREMATURE EJACULATION

Roger T. Crenshaw, Ste. 2132, and Mark G. Wiesner, Ste. 2131, both of 8950 Villa La Jolla, La Jolla, Calif. 92037

Filed Jul. 12, 1991, Ser. No. 729,221
Int. Cl.[5] A61K *31/135*
U.S. Cl. 514—651 **7 Claims**

1. A method of treating a male human patient suffering from premature ejaculation which comprises administering to the patient a dose of fluoxetine effective to delay the onset of ejaculation by the patient during subsequent sexual intercourse.

5,151,449
USE OF L-DEPRENYL FOR RETENTION OF SPECIFIC PHYSIOLOGICAL FUNCTIONS

Norton W. Milgram, Scarborough, Canada, assignor to Deprenyl Animal Health, Inc., Lawrence, Kans.

Filed Aug. 31, 1990, Ser. No. 576,011
Int. Cl.[5] A61K *31/135*
U.S. Cl. 514—654 **4 Claims**

1. A method of treating dogs for the purpose of inducing therein at least one physiological effect evidencing a decrease in cognitive dysfunction, said effect selected from the group consisting of spatial learning, exploratory behavior, and memory response acquisition, said method comprising:

administering to the dog from one to seven times weekly a small but cognitive dysfunction treating effective amount of the compound l-deprenyl or a pharmaceutically acceptable salt form thereof.

5,151,450
ANTIULCER SUBSTANCE

Kiyokazu Murakami, Yokohama, and Susumu Yokura, Kawagoe, both of Japan, assignors to Tokyo Tanabe Company, Limited, Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 659,754
Claims priority, application Japan, Feb. 22, 1990, 2-39663
Int. Cl.[5] A61K *31/12*
U.S. Cl. 514—690 **3 Claims**

1. 4,5-Dihydroxy-2,6,6-trimethyl-2-cyclohepten-1-one.

2. Antiulcer agent containing 4,5-dihydroxy-2,6,6-trimethyl-2-cyclohepten-1-one as effective ingredient.

5,151,451
TRANSLUCENT, THIXOTROPIC HYGEL

Charles R. Brown, Bedford, and Peter Wilding, Wellingborough, both of Great Britain, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed May 29, 1991, Ser. No. 706,819
Claims priority, application United Kingdom, May 29, 1990, 90201357
Int. Cl.[5] A23J *3/00*; B01J *13/00*; A61K *47/42*
U.S. Cl. 514—773 **31 Claims**

1. Translucent, thixotropic, non-particulate denatured protein containing aqueous gel.

5,151,452

PURIFICATION OF POLYCARBONATE AND POLYESTER CARBONATE WASTE

Gerhard Fennhoff, Willich; Wolfgang Jakob, Moers; Manfred Ehlert, Dormagen, and Dieter Freitag, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 17, 1991, Ser. No. 761,209

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1990, 4029886; Dec. 7, 1990, 4039024

Int. Cl.[5] C08J *11/04*

U.S. Cl. 521—48 11 Claims

1. A process for the purification of resinous waste of at least one polycondensate selected from the group consisting of thermoplastic aromatic polycarbonates and thermoplastic aromatic polyester carbonates which waste contains lacquers and optionally dyes and/or metal contaminants comprising in sequence (i) size-reducing the waste to fragments having an average particle size of 0.1 to 5.0 cm, (ii) refluxing said fragments with an aqueous mineral acid while stirring to effect removing of said lacquer and/or dye from said polycondensate, (iii) water-washing while stirring until neutral and until all the lacquer and/or dye components removed from the polycondensate have been rinsed out, (iv) filtering the remaining liquids and drying the resultant fragments, with the proviso where said waste contains no metal contaminants, added metal is introduced to the process before said (ii).

5,151,453

LIGHT-CURABLE IONOMER DENTAL CEMENT

Robert L. Ibsen; Donald R. Pacropis, both of Santa Maria, and William R. Glace, Orcutt, all of Calif., assignors to Den-Mat Corporation, Santa Maria, Calif.

Continuation of Ser. No. 333,904, Apr. 6, 1989, abandoned. This application Aug. 1, 1990, Ser. No. 561,194

Int. Cl.[5] C08F *2/50*; C09K *3/00*

U.S. Cl. 522—14 10 Claims

1. A two-part dental cement system composed of

a. a powder comprising:
   1. Alumina fluoride silicate glass
   2. Barium tungstate
   3. Zinc oxide
   4. Equilibrium mixture of Sodium N(p-tolyl)glycine-glycidyl methacrylate (Na NTG-GMA) with NTG-GMA
   5. Ethyl 4-dimethylamino benzoate; and,

b. a liquid comprising
   6. Ethoxylated bisphenol A dimethacrylate
   7. 2-hydroxyethyl methacrylate
   8. pyromellitic dianhydride-methyl methacrylate (PMDM)
   9. Polyacrylic acid
   10. 2,3-bornanedione
   11. Butylated hydroxytoluene
   12. Benzoyl peroxide
   13. Tartaric acid

powder (a) and liquid (b) being stored separately and brought into use by mixing them in (a)/(b) weight ratios of 2/1–1/1.

5,151,454

PHOTOCURABLE ADHESIVE OF HYDROXY-POLYESTERURETHANE ACRYLATE, MONOMER AND POLYISOCYANATE

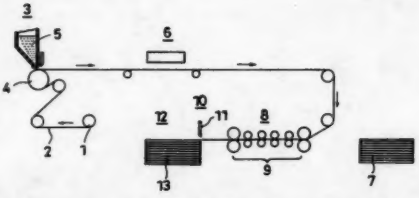
Jugo Goto, Kawanishi; Tsutomu Kubota, Mishima; Reiichi Kotani, Suita, and Masuo Miyaji, Izumi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 496,174, Mar. 20, 1990, abandoned, which is a continuation of Ser. No. 35,025, Apr. 6, 1987, abandoned. This application Dec. 30, 1991, Ser. No. 815,622

Claims priority, application Japan, Apr. 11, 1986, 61-84546; Apr. 11, 1986, 61-84547

Int. Cl.[5] C08F *2/50, 226/02, 283/04*

U.S. Cl. 522—93 3 Claims



1. An adhesive composition for profile lapping which consists essentially of:

(A) a photopolymerizable polyester-polyurethane-polyacrylate or polyester-polyurethane-polymethacrylate which has a number average molecular weight of not less than about 3000 and at least one photopolymerizable acryloyl or methacryloyl group together with one to three hydroxy groups in the molecule in an amount of 5–70% by weight;

the photopolymerizable polyester-polyurethane-polyacrylate or polyester-polyurethane-polymethacrylate being an adduct of (a) a vinyl monomer having hydroxyl groups in its molecule, to (b) a polyester urethane;

the vinyl monomer (a) being at least one member selected from the group consisting of N-methylol acrylic amide, N-methylol methacrylic amide, hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropylacrylate, hydroxypropyl methacrylate, pentaerythritol monoacrylate, pentaerythritol monomethacrylate, allyl alcohol, monoacrylate esters of polyethylene glycol, monomethacrylate esters of polyethylene glycol, monovinyl ethers of ethylene glycol or polyethylene glycol, monovinyl ethers of propylene glycol or polypropylene glycol and a vinyl monomer represented by the formula of

$$CH_2=CHCOOCH_2CH_2OCO(CH_2)_5OH;$$

the polyester urethane (b) being produced by the reaction of a polyester polyol (i) with a polyisocyanate (ii);

the polyester polyol (i) being produced by the reaction of a polybasic carboxylic acid or a polybasic carboxylic anhydride with a polyhydric alcohol;

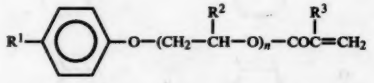
the polybasic carboxylic acid or polybasic carboxylic anhydride being at least one member selected from the group consisting of maleic acid, succinic acid, adipic acid, fumaric acid, phthalic acid, terephthalic acid, isophthalic acid, methylterephthalic acid, methyltetrahydrophthalic acid, tetrahydrophthalic acid, sebacic acid, dodecanedioic acid, azelaic acid, glutaric acid, trimellitic acid, hexahydrophthalic acid, dimer acid and their anhydrides;

the polyhydric alcohol being at least one member selected from the group consisting of ethylene glycol, propylene glycol, butylene glycol, hexylene glycol, decanediol, neopentyl glycol, diethylene glycol, dipropylene glycol, glycerine, trimethylolpropane, 1,4-cyclohexanedimethanol, neopentyl glycol ester of hydroxypivalic acid, 1,4-cyclohexanediol and hydrogenated bisphenol A;

the polyisocyanate (ii) being at least one member selected

from the group consisting of tolylene diisocyanate, diphenylmethane diisocyanate, 3,3'-dimethyldiphenylmethane-4,4'-diisocyanate, naphthylene-1,5-diisocyanate, phenylenediisocyanate, xylylenediisocyanate, 1,6-hexamethylenediisocyanate, 1,4-tetramethylenediisocyanate, isophorone diisocyanate, hydrogenated tolylenediisocyanate, hydrogenated diphenylmethanediisocyanate, hydrogenated xylylenediisocyanate, and their dimers and trimers;

(B) a photopolymerizable monomer which has a molecular weight of about 200–800 and a single photopolymerizable acryloyl group or methacryloyl group, the monomer being represented by the:



wherein R^1 represents hydrogen or alkyl; R^2 and R^3 independently represent hydrogen or methyl; and n is a positive integer, but not less than 2 when all the R^1, R^2 and R^3 are hydrogens;

(C) a polyisocyanate compound in an amount of 5–70% by weight, based on the composition.

5,151,455

FLAME RETARDANT AND FLAME RETARDANT RESIN COMPOSITION

Shigeo Miyata, Takamatsu, and Makoto Yoshii, Kokubunji, both of Japan, assignors to Kyowa Chemical Industry, Kagawa, Japan

Filed Jul. 10, 1990, Ser. No. 550,364

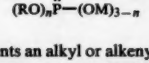
Claims priority, application Japan, Jul. 10, 1989, 1-177763

The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.

Int. Cl.[5] C08K *9/02*

U.S. Cl. 523—200 **7 Claims**

1. A flame retardant comprising 100 parts by weight of magnesium hydroxide which is surface-treated with a phosphoric ester of formula (I)



(I)

wherein R represents an alkyl or alkenyl group having 10 to 30 carbon atoms, M represents an atom belonging to group IA of the periodic table or NH^{4+}, and n represents 1 or 2, and 0.1 to 10 parts by weight of a salt of a metal other than alkali metals with a higher fatty acid.

5,151,456

EMULSIFIED SEALANT HAVING A HIGH SOLIDS CONTENT

Samir F. Elias, Wichita; Kevin Klausmeyer, Clearwater, and Kurt Holland, Pratt, all of Kans., assignors to Koch Industries, Inc., Wichita, Kans.

Filed May 28, 1991, Ser. No. 706,382

Int. Cl.[5] B01J *13/00*

U.S. Cl. 524—60 **22 Claims**

1. An asphalt-rubber composition for use in forming an aqueous emulsion that is pourable at room temperature, said composition comprising:

60–90% by weight asphalt;

in excess of 8% by weight rubber elastomer, at least 2% by weight comprising a liquid rubber; and

0.5–3% by weight of a polymeric surfactant,

said asphalt and said rubber being reacted at 300°–400° F. with a peroxide cross-linking agent present in a quantity of 0.05 to 3% by weight of the combined asphalt and rubber mixture.

5,151,457

RESIN COMPOSITIONS HAVING IMPROVED ANTISTATIC PROPERTIES

Yuzuru Ishida; Haruo Inoue, both of Kanagawa; Ichiro Otsuka, Tokyo; Masato Takaku, Osaka; Masahiro Mitsuboshi; Keiji Iio, both of Kanagawa, and Atsushi Hashimoto, Osaka, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 593,066, Oct. 5, 1990. This application Oct. 22, 1991, Ser. No. 796,918

Claims priority, application Japan, Oct. 9, 1989, 1-262207; Feb. 23, 1990, 2-41118; May 24, 1990, 2-132712; Jul. 4, 1990, 2-175171

Int. Cl.[5] C08K *5/42, 5/06;* C08F *220/18, 212/08*

U.S. Cl. 524—157 **23 Claims**

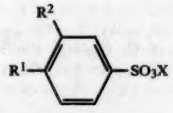
1. A resin molding composition having excellent antistatic properties comprising:

(i) a styrene resin selected from the group consisting of homopolymers of a styrene compound selected from the group of styrene and derivatives thereof, copolymers of at least two such styrene compounds and copolymers of a styrene compound with other copolymerizable monomers;

(ii) 3 to 35 parts by weight based on 100 parts by weight of styrene resin of a polyethylene oxide having a viscosity-average molecular weight ranging from 15,000 to 1,200,000;

(iii) either or both of a (meth)acrylate resin in an amount ranging from 4 to 100 parts by weight per 100 parts by weight of the styrene resin, and an oxide selected from the group consisting of titanium oxide, zinc oxide and magnesium oxide in an amount ranging from 0.7 to 5 parts by weight per 100 parts by weight, of the sum of components (i) and (ii); and

(iv) either a surfactant selected from sulfonic acid salts represented by the formula:



wherein R^1 and R^2 each represents a hydrogen atom or an alkyl group having not more than 12 carbon atoms and X represents at least one alkali metal selected from the group consisting of Na, Li and K or an alkyl sulfate represented by the formula:

$$R^3—OSO_3M$$

wherein R^3 represents an alkyl group having 8 to 20 carbon atoms and M represents at least one ion selected form the group consisting of K, Na and NH_4, in an amount ranging from 0.4 to 5 parts by weight per 100 parts by weight of the sum of the components (i), (ii) and (iii) and wherein components (ii), (iii), and (iv) are mixed into the styrene resin to form said resin molding composition.

5,151,458

HIGHLY FLUID POLYARYLENE SULPHIDE MOULDING COMPOUNDS

Hans-Detlef Heinz; Harald Pielartzik, both of Krefeld; Klaus Reinking, Wermelskirchen; Rolf-Volker Meyer, Krefeld, and Siegfried Korte, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellshcaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 27, 1990, Ser. No. 515,705

Claims priority, application Fed. Rep. of Germany, May 9, 1989, 3915067

Int. Cl.[5] C08J 3/20

U.S. Cl. 524—190 14 Claims

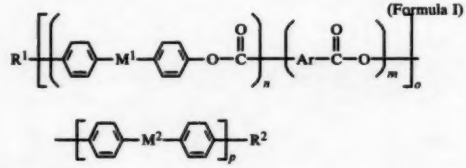
with additive fibre segment

7.5 μm

1. New, highly fluid polyarylene sulphide moulding compounds, comprising

A) from 70–99.9% by weight of polyarylene sulphides,

B) from 0.1 to 30% by weight of one or more low molecular weight, liquid crystalline esters or ester amides of the general structural type corresponding to formula (I) or formula (II):

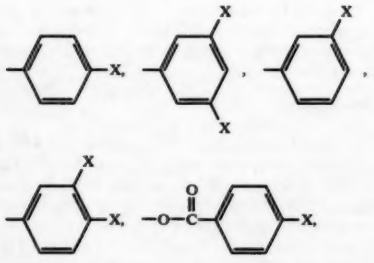


(Formula I)

wherein

Ar denotes an aromatic group with 6–20 carbon atoms which is mononuclear or polynuclear and the polynuclear group is linked through a bond or attached as a condensed group, and

R^1 and R^2 denote independently of one another, H, chlorine, O—C_1–C_4-alkyl, O—C_3–C_6-cycloalkyl, O—C_6–C_{14}-aryl, C_1–C_4-alkyl, C_3–C_6-cycloalkyl, C_6–C_{14}-aryl, fluorinated C_1–C_4-alkyl, fluorinated C_3–C_6-cycloalkyl, fluorinated C_6–C_{14}-aryl, or a group corresponding to one of the formulae (1)/a) to (1)/1):



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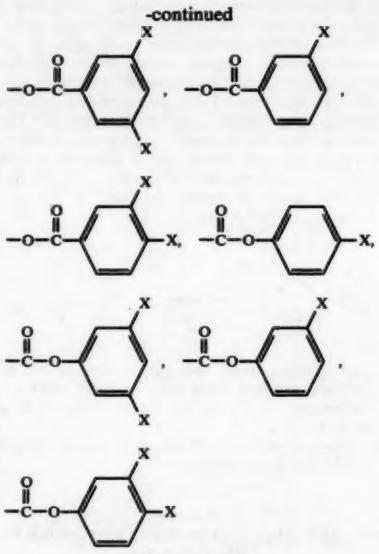
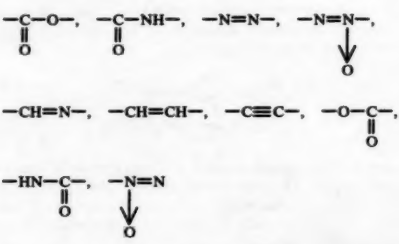


(groups (1.a)–(1.1), are shown in sequence)

wherein

X again denotes the groups defined above for R^1 and R^2

M^1 and M^2 are identical or different and denote double bonded groups corresponding to the following formulae I.1 to I.11:



and —N=CH— formula (I.1)–(I.11) are given in their sequence, and

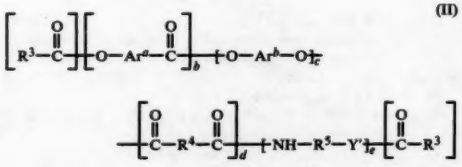
m=zero, 1 or 2,

n=1 or 2,

o=1, 2, 3 or 4 and

p=zero or 1, but when p=zero then

R^2 can only be (1/a), (1)/b), (1)/c), or (1)/d);



(II)

wherein the structural unites are randomly distributed and

R^3 denotes an alkyl group, or an optionally substituted, aryl group, and

is always and end group

Ar^a denotes bivalent, optionally substituted (with the substituents as in R^3) mononuclear or polynuclear aromatic groups having 6 to 24 carbon atoms,

Ar^b denotes bivalent, optionally substituted mononuclear or polynuclear aromatic groups having 6 to 30 carbon atoms,

R^4 and R^5 denote C_mH_{2m} wherein m=0 to 40 (R_4) or 3 to 40 (R_5) or they denote optionally substituted bivalent mononuclear or polynuclear aromatic groups which, in the case of polynuclear groups, are either linked by a bond or attached by condensation,

denotes O,

and when it is linked to an end group of the formula

then it denotes O or NH, and

b=zero to 10,

c=1 to 9,

d=zero to 9, and

e=zero to 3, and

the end groups are formed by structural elements of the type corresponding to the formula

and

C) optionally from 0.001 to approximately 300% by weight, based on the sum of the weight of components A) and B), of other additives.

5,151,459

SUBSTITUTED 1,4-DIAMINO-2-BUTYNE OR PROPARGYLAMINE AS STABILIZERS FOR COMPOSITIONS

Joseph E. Babiarz, Amawalk, N.Y., and Werner Rutsch, Fribourg, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 16, 1991, Ser. No. 701,267

Int. Cl.[5] C08K *5/20, 5/18, 5/17*

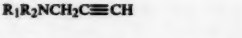
U.S. Cl. 524—255 **13 Claims**

1. A composition stabilized against the deleterious effects of heat or oxygen which comprises

(a) a synthetic polymer, and

(b) an effective stabilizing amount of a compound of formula I, IA, II, IIA, III or IIIA

(I)



(IA)

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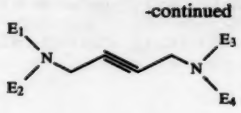
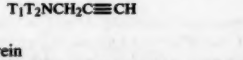


(II)

(IIA)

(III)

or



(IIIA)

wherein

R_1, R_2, R_3 and R_4 are independently a linear or branched alkyl of 1 to 30 carbon atoms; said alkyl substituted with cycloalkyl of 5 to 12 carbon atoms; or said alkyl terminated with —OR_5, —NR_6R_7, —$COOR_9$ or —$CONR_{10}R_{11}$, where R_5, R_6, R_7, R_8 and R_9 are independently alkyl of 1 to 20 carbon atoms or alkenyl of 3 to 18 carbon atoms, and R_{10} and R_{11} are independently hydrogen or the same meaning as R_5; or said alkyl interrupted by one or more —O—, —S—, —SO—, —SO_2—, —CO—, —COO—, —OCO—, —$CONR_{12}$—, —$NR_{12}CO$— or —NR_{13}— where R_{12} and R_{13} have the same meaning as R_{10}; or R_1, R_2, R_3 and R_4 are independently cycloalkyl of 5 to 12 carbon atoms; or alkenyl of 3 to 20 carbon atoms;

E_1 is phenylalkyl of 7 to 9 carbon atoms or said phenylalkyl substituted on the phenyl ring by one or two alkyl of 1 to 12 carbon atoms,

E_2, E_3 and E_4 are independently phenylalkyl of 7 to 9 carbon atoms or said phenylalkyl substituted on the phenyl ring by one or two alkyl of 1 to 12 carbon atoms; or aryl of 6 to 10 carbon atoms or said aryl substituted by one or two alkyl of 1 to 12 carbon atoms, and

T_1, T_2, T_3 and T_4 are independently aryl of 6 to 10 carbon atoms or said aryl substituted by one or two alkyl of 1 to 12 carbon atoms.

5,151,460

OLEFINIC IMPACT MODIFIERS FOR COMPATIBLE BLENDS OF POLYPHENYLENE ETHERS AND LINEAR POLYESTER RESINS

John B. Yates, III, Glemont, N.Y.; Charles F. Pratt, Brasschart, Belgium, and Angelika H. McHale, Mt. Vernon, Ind., assignors to General Electric Co., Selkirk, N.Y.

Division of Ser. No. 94,552, Sep. 9, 1987, Pat. No. 4,916,188.

This application Nov. 21, 1989, Ser. No. 439,768

Int. Cl.[5] C08K *5/09;* **C08L** *51/04, 53/02, 71/12*

U.S. Cl. 524—291 **17 Claims**

1. An impact-modified thermoplastic composition, comprising the following components and any reaction products thereof:

a) a compatible resin composition comprising:

i) at least one polyphenylene ether resin, alone, or in combination with a polystyrene resin;

ii)

(A) at least one poly(alkylene dicarboxylate) resin component which comprises poly(1,4-butylene terephthalate), and

(B) an agent which suppresses ester-carbonate exchange;

the weight ratio of component (i) to component (ii) having a maximum value of 1.5:1; and

iii) at least one polymer containing a substantial proportion of bisphenol A polycarbonate units; and

b) an effective amount of an impact modifier comprising an

EPDM terpolymer grafted with glycidyl methacrylate or glycidyl acrylate or a mixture thereof, alone, or grafted in further combination with a C_1–C_{18} alkyl methacrylate or acrylate or a mixture thereof.

5,151,461

EDGE PADDING ADHESIVE COMPOSITION FOR CARBONLESS PAPERS

Kenneth J. Perrington, and Clair J. Emery, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 306,327, Feb. 7, 1989, Pat. No. 5,079,068. This application Nov. 27, 1990, Ser. No. 618,451

Int. Cl.[5] C08J *3/05*

U.S. Cl. 524—387 **12 Claims**

1. An adhesive composition that is capable of adhesively edge padding a stack of sets of collated sheets to permit that stack to be fanned apart into individual sets, said adhesive composition comprising by weight:

a) from 7.5 to 20 dry weight % of a water-based latex adhesive polymer,

b) from 2.5 to 12.5% of a noncrystallizing low-molecular-weight, water-soluble, polyhydric alcohol, and as little as 0.5% when the polyhydric alcohol is non-crystalline sorbitol,

c) from 12.5 to 27.5% of a low-molecular-weight, water-soluble, monohydric alcohol, and

d) from 40 to 75% of water, wherein the latex adhesive polymer is selected from the group consisting of poly(vinyl acetate), poly(styrene/butadiene), poly(vinylidene chloride/butadiene), poly(ethylacrylate/methacrylate), and polyethylacrylate.

5,151,462

FLAME RETARDANT BLENDS OF POLYSULFONE AND POLYALKYLENE PHTHALATE

Mohammad J. El-Hibri; Gregory S. Jack; William E. Kelly, all of Roswell, and Sanjay R. Patel, Alpharetta, all of Ga., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 30, 1991, Ser. No. 768,016

Int. Cl.[5] C08K *3/38*

U.S. Cl. 524—405 **10 Claims**

1. A flame retardant polymer blend comprising (a) polysulfone; (b) polyalkylenephthalate; (c) borate salt; and (d) polytetrafluoroethylene.

5,151,463

RESIN COMPOSITIONS INCLUDING CERAMICS EMITTING FAR INFRARED RAYS

Koji Hayafune, Tokyo; Shinichi Naemura, Yokohama; Hiroshige Yasumoto, Osaka, and Hideo Amemiya, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

PCT No. PCT/JP89/00884, § 371 Date Mar. 12, 1990, § 102(e) Date Mar. 12, 1990, PCT Pub. No. WO90/02152, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 30, 1989, Ser. No. 465,214

Claims priority, application Japan, Aug. 30, 1988, 63-213615

Int. Cl.[5] C08K *3/22*

U.S. Cl. 524—430 **7 Claims**

1. A resin composition comprising a hygroscopic resin and a ceramic effective for emitting far infrared rays, said hygroscopic resin having a water absorption rate not less than 0.1% when measured by ASTM D-570, wherein said hygroscopic resin is a high nitrile resin.

5,151,464

MISCIBLE POLYBLENDS OF ACID-AND ANHYDRIDE-CONTAINING COPOLYMERS

Lau S. Yang, Wilmington, Del., assignor to Arco Chemical Technology, L.P., Wilmington, Del.

Filed Aug. 30, 1991, Ser. No. 752,753

Int. Cl.[5] C08L *35/06, 25/08*

U.S. Cl. 524—449 **21 Claims**

1. A miscible polyblend comprised of

(a) an acid-containing copolymer comprised of, in polymerized form, from 5 to 20 weight percent of an α,β-unsaturated carboxylic acid selected from methacrylic acid and acrylic acid and from 80 to 95 weight percent of a first vinyl aromatic monomer; and

(b) an anhydride-containing copolymer comprised of, in polymerized form, from 5 to 20 weight percent of an α,β-unsaturated dicarboxylic acid anhydride and from 80 to 95 weight percent of a second vinyl aromatic monomer;

with the proviso that the amount of α,β-unsaturated carboxylic acid in the acid-containing copolymer is not more than 75 percent greater than the amount of α,β-unsaturated dicarboxylic acid anhydride in the anhydride-containing copolymer and characterized by the absence of a styrene butadiene block copolymer.

5,151,465

POLYMER COMPOSITIONS AND ABSORBENT FIBERS PRODUCED THEREFROM

Bi Le-Khac, West Chester, Pa., assignor to ARCO Chemical Technology, L.P., Wilmington, Del.

Division of Ser. No. 460,681, Jan. 4, 1990. This application Apr. 1, 1991, Ser. No. 678,481

Int. Cl.[5] L08L *31/02*

U.S. Cl. 524—549 **22 Claims**

1. A fiberizable, aqueous, uncured but curable, polymer composition comprising the reaction product of:

(a) a partially neutralized aqueous polymer composition prepared by the reaction of a strong base with a polymer containing at least 25 mole percent recurring units of an α,β-unsaturated monomer having in its molecule one or two carboxyl groups or one or two other groups convertible to and converted to carboxyl groups, the degree of neutralization of said partially neutralized polymer being within the range of from about 0.2 to about 0.8 equivalent of total carboxyl groups of the α,β-unsaturated monomer, with

(b) from about 0.1 to about 10 total parts by weight of at least one reactive compound per 100 parts by weight of the partially neutralized aqueous polymer composition, the reactive compound being a water soluble compound bearing one amine group and at least one hydroxyl group, wherein the reaction product is formed by an ionic bonding reaction between the unneutralized carboxyl groups on the polymer and the amine groups on the reactive compound, and is stable at room temperature and can be made into absorbent fibers.

5,151,466

SINGLE STEP BULK PROCESS FOR HIGH IMPACT POLYESTER MASTERBATCHES, PRODUCTS THEREOF AND BLENDS WITH POLYESTERS

Shrikant V. Phadke, 14416 Brittmore Ave., Baton Rouge, La. 70817

Division of Ser. No. 235,315, Aug. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 183,437, Apr. 13, 1988, abandoned, which is a continuation of Ser. No. 4,090, Jan. 16, 1987, abandoned. This application Mar. 28, 1990, Ser. No. 500,550

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.[5] C08L *67/02, 77/00*

U.S. Cl. 525—177 **10 Claims**

1. The method of preparing a masterbatch for blending with a polyester or polyamide based matrix resin to form a thermoplastic molding composition comprising reacting in a single step in the presence of a free radical initiator less than the full increment of the matrix resin, constituting from about 10 to about 80 percent by weight of the amount of matrix resin in the final composition, with a backbone rubber selected from the group consisting of a rubber component formed by interpolymerization of ethylene, one or more C_3–C_{16} mono-olefins, and a polyene, a copolymer rubber formed by the copolymerization of ethylene and one or more mono-olefins containing 3–16 carbon atoms, and mixtures thereof, and an ester of acrylic or methacrylic acid having an epoxide functionality, said ester being present in an amount within the range of 2–15 parts by weight per 100 parts by weight of said backbone rubber.

5,151,467

N-HALOTHIOSULFONAMIDE MODIFIED RUBBER PRODUCTS AND PROCESS FOR PREPARING THE SAME

Donald A. White, Edison, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 626,805, Dec. 13, 1990, abandoned, which is a division of Ser. No. 439,777, Nov. 20, 1989, Pat. No. 5,034,468, Continuation-in-part of Ser. No. 244,743, Sep. 15, 1988, Pat. No. 4,956,420. This application Oct. 24, 1991, Ser. No. 782,028

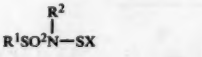
Int. Cl.[5] C08L *27/22*

U.S. Cl. 525—215 **3 Claims**

1. A composite comprising about 100 parts by weight of a modified rubber product, said modified rubber product comprising

(a) a rubber component selected from the group consisting of a polymer of an isoolefin containing from 4 to 7 carbon atoms and at least one conjugated multiolefin containing from 4 to 14 carbon atoms; a halogenated polymer of an isoolefin containing from 4 to 7 carbon atoms and at least one conjugated monoolefin containing from 4 to 14 carbon atoms; and mixtures thereof; and

(b) a N-halothiosulfonamide component of the formula:



Wherein X is chlorine or bromine, and wherein R^1 and R^2 are selected from the group consisting of alkyl groups having from 1 to 20 carbon atoms, aralkyl groups having from 7 to 20 carbon atoms, substituted aryl groups having from 6 to 10 carbon atoms, and wherein R^2 is also selected from a group having the formula:

Wherein R^3 and R^4 are individually selected from said alkyl, aryl, and substituted aryl groups and wherein R^3 and R^4 can be joined together to represent groups selected from the group consisting of

$$-(CH_2)_n-,$$

wherein n is an integer ranging from 4 to 7 and

$$-(CH_2)_2-O-(CH_2)_2-,$$

said N-halothiosulfonamide component being comprised is said modified rubber product in an amount from about 0.005 millimole to about 0.6 millimole per gram of said modified rubber product, in admixture with about 18 to about 670 parts by weight of a rubbery polymer selected from the group consisting of cis-1,4-polyisoprene natural rubber, synthetic cis-1,4-polyisoprene, polybutadiene, butadiene-styrene copolymer with a butadiene to styrene mole ratio in the range of about 60 to 40 to about 95 to 5, butadieneacrylonitrile copolymer, polypentenamer of the type derived from open ring polymerization of cyclopentene, bromobutyl rubber, chlorobutyl rubber and polychloroprene and mixtures thereof.

5,151,468

LOW HEAT GENERATION RUBBER COMPOSITIONS CONTAINING THIADIAZOLE COMPOUND

Ichiro Nakajima; Kazuya Hatakeyama, both of, Kodaira, and Yasushi Hirata, Sayama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 311549, Feb. 16, 1990, abandoned. This application Jul. 12, 1990, Ser. No. 552,360

Claims priority, application Japan, Feb. 16, 1988, 63-31868

Int. Cl.[5] C08C *19/20*

U.S. Cl. 525—332.7 **4 Claims**

1. A low heat generation type rubber composition consisting essentially of at least one rubber selected from the group consisting essentially of natural rubber, synthetic polyisoprene rubber, styrene-butadiene copolymer rubber, polybutadiene rubber, and butyl rubber, a reinforcing filler, and a thiadiazole compound expressed by the following general formula:

in which R_1 and R_2, which may be the same as or differ from each other, denote a mercapto group, an amino group, and a trifluoromethyl group, said reinforcing filler and said thiadiazole compound being 20 to 150 parts by weight and 0.1 to 10 parts by weight with respect to 100 parts by weight of said at least one rubber, respectively.

5,151,469

METHOD OF PREPARING ELASTOMERS HAVING REDUCED HYSTERESIS PROPERTIES WITH SULFOXIDES

William L. Hergenrother, Akron, and John M. Doshak, Mogadore, both of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 21, 1991, Ser. No. 703,533

Int. Cl.[5] C08F *8/34;* **C08C** *19/20*

U.S. Cl. 525—354 **9 Claims**

1. A method of preparing an elastomer having reduced hysteresis properties comprising the steps of:

reacting an anionic polymer having at least one functional site, with about one equivalent of a sulfoxide compound selected from the group consisting of diphenyl sulfoxide, dibutyl sulfoxide, di-para-tolyl sulfoxide, di-4-chlorophenyl sulfoxide and methyl methylsulfinylmethyl sulfide; and,

curing said adduct in the presence of a suitable cure catalyst,

wherein said anionic polymer is formed from a monomer solution comprising a monomer component selected from the group consisting of conjugated dienes having from about 4 to about 12 carbon atoms, monovinyl aromatic monomers having from 8 to about 18 carbon atoms, trienes and mixtures thereof.

5,151,470

AMINOCROTONATES AS CURING AGENTS FOR EPOXY RESINS

Joseph Sanders, Leverkusen, Fed. Rep. of Germany; Robson Mafoti, Pittsburgh, Pa., and Peter H. Markusch, McMurray, Pa., assignors to Miles Inc., Pittsburgh, Pa.

Filed Jan. 10, 1992, Ser. No. 819,029

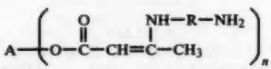
Int. Cl.[5] C08G *59/52*

U.S. Cl. 525—407 **4 Claims**

1. A heat curable composition comprising:

a) an epoxide compound with, on average, more than one epoxide group in the molecule, and

b) a β-aminocrotonate of the general formula:



where

R represents a hydrocarbon radical,

A represents the polyfunctional radical left by removal of the hydroxyl groups from a polyol of molecular weight of from about 800 to about 6000 and functionality n, and

n is an integer of from 2 to 6,

with the ratio of component a) to component b) being such that at least one half moles of amine groups are present for each mole of epoxide group.

5,151,471

EPOXY MATRIX RESIN FORMULATIONS WITH IMPROVED STORAGE STABILITY CONTAINING POWDERED DIAMINE DISPERSIONS

Shahid P. Qureshi, Alpharetta, and Hugh C. Gardner, Roswell, both of Ga., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 23, 1990, Ser. No. 601,900

Int. Cl.[5] C08G *59/50*

U.S. Cl. 525—423 **7 Claims**

1. A composition comprising N,N,N',N'-tétraglycidylbis(4-amino-3-ethylphenyl) methane and from about 6 to about 150 pbw, per 100 pbw epoxy resin component, of a solid diamine hardener selected from the group consisting of 3,3'-diaminodiphenyl sulfone and 4,4'-bis(4-aminophenoxy) diphenyl sulfone dispersed therein as a finely divided solid at room temperature.

5,151,472

METHOD OF PREPARING RIGID ROD POLYMERS IN THERMOPLASTIC MATRICES

David A. Valia, San Diego, Calif., assignor to General Dynamics Corporation, Convair Division, San Diego, Calif.

Filed Aug. 10, 1990, Ser. No. 565,394

Int. Cl.[5] C08L *79/08*

U.S. Cl. 525—432 **14 Claims**

1. The method of preparing a polymeric product comprising a substantially uniform mixture of rod shaped polyimide polymer molecules dispersed in a coil shaped polymer matrix, which comprises the steps of:

providing a polyetherimide having coil shaped polymer molecules;

dissolving said polyetherimide in a solvent;

adding thereto a dianhydride and a diamine;

reacting said dianhydride and diamine to form a polyamic acid;

adding thereto a cyclizing agent to cause said polyamic acid to partially cyclize to a polyimide;

removing excess cyclizing agent;

heating the resulting mixture to at least a shape-retaining structural state; and

heating the shape-retaining structure to complete polymerization of said polyimide;

whereby a structure having rod shaped molecules substantially uniformly dispersed in coil shaped matrix molecules results.

5,151,473

ORGANOPOLYSILOXANES CONTAINING SULFOSUCCINATE GROUPS

Christian Herzig, Taching, Fed. Rep. of Germany, assignor to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

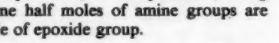
Filed Nov. 6, 1990, Ser. No. 609,680

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1989, 3940536

Int. Cl.[5] C08F *283/00*

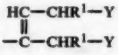
U.S. Cl. 525—474 **6 Claims**

1. An organopolysiloxane which contains sulfo-succinate groups and contains average units of the general formula

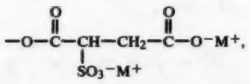


(I)

in which R is selected from the group consisting of monovalent hydrocarbon radicals having from 1 to 18 carbon atom(s) per radical and monovalent halogenated hydrocarbon radicals having from 1 to 18 carbon atom(s) per radical, Z is a radical of the formula



in which Y is a radical of the formula



R^1 is selected from the group consisting of a hydrogen atom and an alkyl radical having from 1 to 4 carbon atom(s) per radical and M^+ is selected from the group consisting of a hydrogen ion, an alkali metal ion, an ammonium ion and mixtures thereof, a is 0 or 1, with an average of from 0.03 to 1.0, b is 0, 1, 2 or 3, with an average of from 1.0 to 2.5, and the sum of a+b does not exceed 3, with the proviso that the compound contains at least one Z radical per molecule.

5,151,474

PROCESS CONTROL METHOD FOR MANUFACTURING POLYOLEFIN

Sandra V. Lange, Lake Jackson; David P. Denton, Richwood; Joseph P. Weller; Jean P. Chauvel, Jr., both of Lake Jackson; Stuart Farquharson, Freeport, all of Tex.; Harry D. Ruhl, Jr., Midland, Mich., and Gregory A. Winter, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 16, 1990, Ser. No. 481,020

Int. Cl.[5] C08F *2/06*

U.S. Cl. 526—60 **18 Claims**

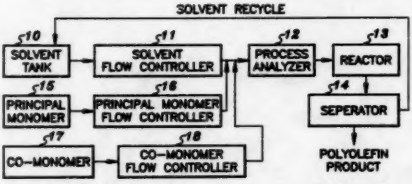
1. A process control method for controlling a polyolefin polymerization process, comprising the steps of:

(a) flowing a stream of recycled solvent into a polyolefin polymerization reactor;

(b) adding a principal olefin monomer to the stream of recycled solvent;

(c) adding a co-monomer to the stream of recycled solvent at a controllable rate;

(d) determining the concentration of the principal monomer and the concentration of the co-monomer in the stream of



recycled solvent by high resolution multi-wavelength vibrational spectroscopic analysis; and

(e) controlling the rate of addition of the co-monomer according to the determination of step (d).

5,151,475

TERMINATION OF ANIONIC POLYMERIZATION

Craig A. Stevens; Carma J. Gibler, both of Houston; Linda R. Chamberlain, Richmond, and Thomas F. Brownscombe, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 15, 1991, Ser. No. 685,111
Int. Cl.[5] C08F *2/38*
U.S. Cl. 526—83 **20 Claims**

1. In a process for anionically polymerizing monomers with an anionic polymerization initiator in a suitable solvent thereby creating a living polymer, the improvement which comprises terminating the polymerization by the addition of a terminating agent selected from the group consisting of, ammonia, and silanes.

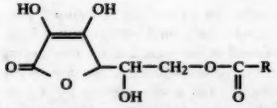
5,151,476

MICRO-SUSPENSION POLYMERIZATION OF VINYL CHLORIDE WITH ASCORBIC ACID AND WATER-SOLUBLE METAL SALTS

Richard A. Marshall, Akron; James W. Hershberger, and Susan A. Hershberger, both of Oxford, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 90,998, Aug. 31, 1987, abandoned. This application Jul. 12, 1990, Ser. No. 551,364
Int. Cl.[5] C08F *2/16*
U.S. Cl. 526—93 **14 Claims**

1. In a process for the micro-suspension polymerization of vinyl chloride monomer into polyvinyl chloride in the presence of water and an emulsifier, the improvement which comprises utilizing as the initiator a redox system which is comprised of (a) a free radical generator, (b) a reducing agent selected from the group consisting of ascorbic acid, isoascorbic acid, and ascorbic acid derivatives having the structural formula:



wherein R is an alkyl group containing from 1 to 30 carbon atoms, and (c) a water-soluble metal salt of iron, copper, cobalt, nickel, tin, titanium, vanadium, manganese, chromium or silver; wherein the molar ratio of said water-soluble metal salt to said free radical generator is within the range of 0.0001 to 0.01.

5,151,477

COPOLYMERIZATION OF VINYL ACETATE AND A FLUOROMONOMER IN AN AQUEOUS MEDIUM

Bryce C. Oxenrider, Florham Park, N.J.; David J. Long, Amherst, N.Y., and Frank Mares, Whippany, N.J., assignors to Allied-Signal Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 424,441, Dec. 20, 1989, Pat. No. 5,070,162, which is a continuation-in-part of Ser. No. 123,480, Nov. 20, 1987, abandoned. This application Nov. 22, 1991, Ser. No. 796,184
The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.
Int. Cl.[5] C08F *2/00, 14/18*
U.S. Cl. 526—216 **27 Claims**

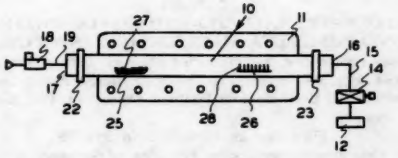
1. A process of forming a copolymer comprising 40 to 60 mole percent of fluorinated units having the formula (R_1R_2C—CR_3F) wherein R_1, R_2 and R_3 are the same or different and are selected from H and F, and R_3 is Cl, when R_1 and R_2 are F; and correspondingly from 60 to 40 mole percent of vinyl units having the formula (H_2C—CHR_x), wherein R_x is a radical of the formula O_2CR_y and wherein R_y is a radical selected from the group consisting of —CH_3, —C_2H_5, —CF_3 and C_2F_5 wherein the fluorinated units and vinyl units are in a substantially alternating distribution as determined by 1H Fourier Transform Nuclear Magnetic Resonance Spectroscopy; said process comprising copolymerizing a vinyl monomer of the formula: H_2C=CHO_2CR_y and a fluoromonomer of the formula R_1R_2C=CFR_3 in an aqueous reaction medium consisting essentially of a solution of water and one or more water miscible co-solvent in the absence or in the substantial absence of a distinct organic co-solvent phase in the reaction mixture and in the presence of an initiator; and maintaining the molar ratio of vinyl monomer to fluoromonomer dissolved in the reaction medium constant or substantially constant during said co-polymerizing to form a copolymer having an alternating or substantially alternating distribution of monomeric units derived from said vinyl monomer and said fluoromonomer in said copolymeric backbone.

5,151,478

HIGHLY CONDUCTING ORGANIC POLYMER THIN FILM COATINGS

Long Y. Chiang, Somerset, and Wen-Yih F. Lai, Fair Lawn, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Aug. 15, 1991, Ser. No. 745,298
Int. Cl.[5] C08F *126/06, 132/08;* C08G *73/06*
U.S. Cl. 526—258 **4 Claims**



1. A polymer formed by vaporizing a compound selected from the group consisting of anthracene, pyrene, pentacene, phenazine, pyrido-bipyrazine, terpyridine, bipyrazine and alkyl derivatives thereof in which the alkyl group has from 1 to about 10 carbon atoms said vaporizing being conducted in the presence of a substrate at temperatures and pressures and for a time sufficient to promote the polymerization of the compound and the deposition of the formed polymer on the substrate.

5,151,479

DENTAL ADHESIVE COMPOSITION

Nobuhiro Mukai; Hitoshi Ige; Takayuki Makino, and Junko Atarashi, all of Hiroshima, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 511,742

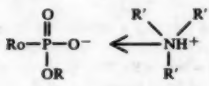
Claims priority, application Japan, Apr. 20, 1989, 1-101291

Int. Cl.[5] C08F *230/02, 220/34;* A61K *6/10*

U.S. Cl. 526—277 10 Claims

1. A dental adhesive composition consisting essentially of

(a) an aliphatic amine salt of a polymerizable phosphoric ester represented by the following formula



where R is $CH_2=CHCO_2(CH_2)_nO(CH_2)$—, $CH_2=C(CH_3)CO_2(CH_2)_n$—, $CH_2=CHCO_2(CH_2)_n$—, $CH_2=C(CH_3)CO_2)(CH_2)_nO(CH_2)$— or hydrogen, n is a whole number of 1 to 5, the two R radicals are not hydrogen at the same time, R′ is a hydrocarbon radical having 1 to 5 carbon atoms or any of the radicals described above for R, the three R′ radicals are not all hydrogen at the same time, the three R′ radicals do not all contain an unsaturated bond at the same time;

(b) at least one radical-polymerizable unsaturated monomer, and

(c) a radical polymerization initiator.

5,151,480

PROCESS FOR THE PRODUCTION OF MOULDINGS OF CROSSLINKED POLYMERS

Wolfgang Podszun, Koeln; Michael Müller, Bergisch Gladbach; Wilfried Cramer, Leverkusen, and Bodo Rehbold, Koeln, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 3, 1991, Ser. No. 709,512

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1990, 4018714

Int. Cl.[5] C08F *230/08*

U.S. Cl. 526—279 10 Claims

1. A process for the production of a molding of a crosslinked polymer comprising molding in a predetermined shape a cross-linkable but uncrosslinked copolymer of a vinyl compound and a polymerizable silane compound having 1 to 3 hydrolyzable groups, and treating the molding with an acidic or alkaline aqueous solution, thereby to effect cross-linking of the copolymer.

5,151,481

POLYMERS HAVING LIQUID CRYSTAL PHASES CONTAINING 2-CYANOACRYLIC ACID ESTER GROUP

Heino Finkelmann, and Bernfried Messner, both of Freiburg, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

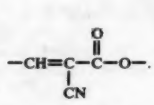
Filed Aug. 29, 1989, Ser. No. 399,973

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1988, 3829375

Int. Cl.[5] C08F *22/32, 122/32*

U.S. Cl. 526—298 8 Claims

1. In a polymer having a liquid crystalline phase and comprising a polymeric backbone and pendant mesogenic groups bonded directly or via a spacer to said backbone, the improvement wherein at least one of the mesogenic groups contains a 2-cyanoacrylic acid ester structural element of the formula I



I

5,151,482

PROCESS FOR THE PRODUCTION OF METHACRYLIC RESIN SHEETS

Hiroyuki Ikeda; Michitoshi Shinka, both of Toyama; Suehiro Tayama, Otake; Tetuya Sawano, Otake, and Masahiro Saruta, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Japan

Filed Aug. 12, 1991, Ser. No. 743,998

Claims priority, application Japan, Sep. 4, 1990, 2-233998

Int. Cl.[5] C08F *120/14, 4/34, 4/04*

U.S. Cl. 526—329.7 11 Claims

1. A process for producing a methacrylic resin sheet comprising forming a syrup by partially polymerising methyl methacrylate alone or a monomer mixture of at least 60% by weight of methyl methacrylate and up to 40% by weight of an acrylic or methacrylic ester adding a polymerization initiator comprising at least one peroxy ester having a 10-hour half-life temperature of from 50 to 58° C. and 2,2′-azobisisobutyronitrile to the syrup, introducing the syrup into a mold, polymerizing the syrup in the mold in a first step at a temperature of from 75° C. to 90° C. for a period of 5 to 15 minutes, further polymerizing the syrup in a second polymerization step at a temperature of from 3 to 12° C. below that of the first polymerization step until a conversion of monomer to polymer of 80 to 95% is attained and heat-treating the polymerization product at a temperature of 95° to 140° C. to substantially complete the polymerization thereby forming a methacrylic resin sheet.

5,151,483

PROCESS FOR THE PRODUCTION OF REINFORCED POLYURETHANE MOLDINGS BY THE REACTION INJECTION MOLDING PROCESS

Stephen J. Harasin, Morgan; David F. Sounik, Bridgeville, and Timothy J. Kelly, Oakdale, all of Pa., assignors to Miles Inc., Pittsburgh, Pa.

Filed Mar. 13, 1991, Ser. No. 669,145

Int. Cl.[5] C08G *18/08, 18/70;* B27N *3/10*

U.S. Cl. 528—44 3 Claims

1. In a process for producing a molded part comprising reacting an organic isocyanate with an active hydrogen group-containing material in the presence of a reinforcing fiber mat in a closed mold via the RIM process, the improvement wherein:

i) said isocyanate has a viscosity at 25° C. of at least 200 mPa.s and no more than 1000 mPa.s,

ii) said active hydrogen group-containing material has a viscosity at 25° C. of at least about 300 mPa.s and no more than 3000 mPa.s, and

iii) said mat comprises from about 14% by weight to about 60% by weight of said part.

5,151,484

ISOCYANATE PREPOLYMERS CONTAINING ETHER AND ESTER GROUPS A PROCESS FOR THEIR PREPARATION AND THEIR USE FOR THE PRODUCTION OF COATING, SEALING OR CASTING COMPOSITION

Lutz Schmalstieg, Cologne; Peter Hihlein, Kempen; Josef Pedain, Cologne, and Wolfhart Wieczorrek, Kempen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 21, 1992, Ser. No. 823,226

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1991, 4102341

Int. Cl.[5] C08G *18/80*

U.S. Cl. 528—45 20 Claims

1. An isocyanate prepolymer containing ether and ester groups, having an isocyanate content of 1.9 to 25% by weight and comprising the reaction product of

A) a polyisocyanate component containing at least one organic polyisocyanate and having an average molecular weight of 168 to 1000,

B) an organic polyhydroxyl component containing

1) at least one polyhydroxyl compound containing ether and ester groups, having an average hydroxyl functionality of 2 to 3 and an average hydroxyl number of 40 to 90 and comprising the esterification product of

i) at least one polyether polyol having an average hydroxyl number of 200 to 600 with

ii) from 25 to 67 equivalent-%, based on the hydroxyl groups of component (i) and the carboxyl groups of component (ii), of an organic carboxylic acid component containing at least one organic monocarboxylic acid or a mixture of at least one organic monocarboxylic acid with up to 20 carboxyl equivalent-%, based on all the carboxylic acids, of polybasic organic carboxylic acids and

2) optionally an organic polyhydroxyl compound having a molecular weight of 62 to 200 in a quantity of up to 25 hydroxyl equivalent-%, based on component B1).

5,151,485

ADVANCED EPOXY COMPOSITIONS, CURABLE COMPOSITIONS AND CURED PRODUCTS

Duane S. Treybig; David S. Wang; Pong S. Sheih, and Loan A. Ho, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 616,506, Nov. 21, 1990, Pat. No. 5,095,050. This application Oct. 30, 1991, Ser. No. 785,380

Int. Cl.[5] C08G *59/06, 59/18*

U.S. Cl. 528—87 2 Claims

1. An advanced composition resulting from reacting (1) at least one of (a) at least one epoxidized triglyceride of a fatty acid, or (b) at least one epoxidized fatty acid having an average of more than one unsaturated group per molecule or (c) at least one diepoxyalkane, or (d) any combination of any two or more of (a), (b) or (c), or (e) a combination of any one or more of (a), (b) or (c) and (f) a diglycidyl ether of a dihydric phenol; with (2) a dihydric phenol.

5,151,486

METHOD OF MANUFACTURING RADIOACTIVE RAY MEASURING DEVICE USING PURE DGEBA AND DDM IN 1:1 MOLAR RATIO

Masakazu Washio, Yokohama, and Syun-ichi Kawanishi, Osaka, both of Japan, assignors to Sumitomo Heavy Industries, Ltd. and Japan Atomic Energy Research Institute, both of Tokyo, Japan

Filed May 1, 1990, Ser. No. 517,030

Claims priority, application Japan, May 1, 1989, 1-112559

Int. Cl.[5] C08G *59/58*

U.S. Cl. 528—124 4 Claims

1. A method of manufacturing a radioactive ray measuring device comprising the steps of:

mixing diglycidylether of bisphenol A and diaminodiphenylmethane at a 1:1 molar ratio, both not containing any metal salt;

pre-curing the mixture at a temperature of 80°–120° C. to align the two components and to achieve preliminary bridging; and

curing the pre-cured mixture at a temperature of 140°–180° C. to achieve sufficient bridging to produce epoxy resin of purity of at least 99%.

5,151,487

METHOD OF PREPARING A CROSSLINKING OLIGOMER

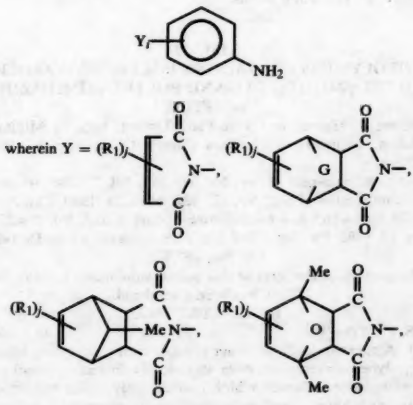
Hyman R. Lubowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 489,205, Mar. 5, 1990, Pat. No. 5,087,701, which is a continuation of Ser. No. 46,202, May 4, 1987, Pat. No. 4,935,523, which is a continuation-in-part of Ser. No. 865,228, May 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 781,487, Sep. 30, 1985, Pat. No. 4,685,620. This application Nov. 26, 1991, Ser. No. 798,626

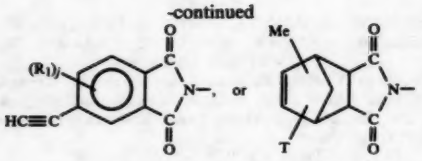
Int. Cl.[5] C08G *73/10;* C07D *491/08*

U.S. Cl. 528—170 8 Claims

1. A method for preparing a crosslinking oligomer comprising reacting an imidophenylamine end cap monomer and a monomer having a functionality reactive with an amine group, the imidophenylamine end cap monomer corresponding to the formula:



-continued



R_1=lower alkyl, lower alkoxy, aryl, aryloxy, substituted alkyl, substituted aryl, halogen, or mixtures thereof, wherein the substituents for alkyl or aryl are selected from the group consisting of hydroxyl or halogeno;
Me=methyl;
T=allyl or methallyl;
i=1 or 2;
j=0, 1, or 2; and
G=—CH_2—, —O—, —S—, or —SO_2—.

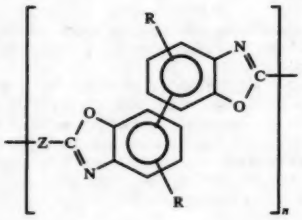
5,151,488

LIQUID CRYSTAL POLYMERS CONTAINING A REPEATING BISOXAZOLE STRUCTURE

David A. Hutchings, Tucker, Ga., and Richard L. Brandon, Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 12, 1991, Ser. No. 790,558
Int. Cl.[5] C08G *73/22*
U.S. Cl. 528—179 **18 Claims**

1. A liquid crystal polymer having a structure comprising repeating units selected from the group consisting of



(I)

where n is an integer of about 10 to 30; R is an alkyl group of about 1 to 9 carbon atoms; an aryl group of about 6 to 12 carbon atoms; an alkoxy group of about 1 to 4 carbon atoms; an aryloxy group of about 6 to 12 carbon atoms, an alkaryl group of about 7 to 13 carbon atoms, an aralkyl group of about 7 to 13 carbon atoms, or halogen; and Z is an arylene group having about 6 to 12 carbon atoms.

5,151,489

COPOLYMERS CONTAINING POLYBENZOXAZOLE, POLYBENZOTHIAZOLE AND POLYBENZIMIDAZOLE MOIETIES

William J. Harris, and Wen-Fang Hwang, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 378,360, Jul. 7, 1989, which is a continuation of Ser. No. 327,925, Mar. 23, 1989, Pat. No. 5,030,706, which is a continuation-in-part of Ser. No. 256,338, Oct. 12, 1988, Pat. No. 5,089,568. This application Sep. 15, 1989, Ser. No. 407,973
The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.
Int. Cl.[5] C08G *75/32*
U.S. Cl. 528—183 **48 Claims**

1. A thermoplastic polymer composition comprising blocks of polybenzoxazole polymer chemically linked to blocks of thermoplastic polymer which contain polyamide, polyimide, polyquinoxaline, polyquinoline, poly(aromatic ketone), poly(aromatic sulfone), poly(aromatic ether) or a copolymer of one of those polymers, wherein the thermoplastic composition has a glass transition temperature of no more than about 400° C., is not substantially phase separated, and can be heated to its glass transition temperature without substantial phase separation.

5,151,490

POLYBENZOXAZOLES HAVING PENDANT METHYL GROUPS

William J. Harris, and Zenon Lysenko, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 425,159, Oct. 23, 1989, Pat. No. 5,021,580. This application Apr. 1, 1991, Ser. No. 678,491
Int. Cl.[5] C08G *65/48, 63/00*
U.S. Cl. 528—183 **10 Claims**

1. A polybenzoxazole polymer having a plurality of mer units, wherein at least one mer unit comprises:
(a) a first aromatic group;
(b) two oxazole rings fused with the first aromatic group;
(c) a methyl group bonded to the first aromatic group; and
(d) a divalent organic moiety which is stable and inert under polybenzoxazole polymerizing conditions bonded to one of the azole rings.

5,151,491

CATALYTIC MELT CONDENSATION PREPARATION OF POLYCARBONATE

Takeshi Sakashita, and Tomoaki Shimoda, both of Yamaguchi, Japan, assignors to GE Plastics Japan, Ltd., Tokyo, Japan

Filed Sep. 21, 1989, Ser. No. 410,464
Claims priority, application Japan, Sep. 22, 1988, 63-238428; Sep. 22, 1988, 63-238429
Int. Cl.[5] C08G *64/20*
U.S. Cl. 528—199 **21 Claims**

1. A process for the production of polycarbonates comprising melt polycondensing an aromatic dihydroxy compound and a carbonic acid diaromatic ester having from 13 to 16 carbon atoms in the presence of (1) from 0.05 to 15 mol %, based on 1 mole of the aromatic dihydroxy compound, of a monohydric phenol having from about 10 to 40 carbon atoms and (2) a catalyst comprising
(a) a nitrogen containing basic compound, and
(b) from 10^{-8} to 10^{-3} mole, based on 1 mole of the aromatic dihydroxy compound, of an alkali metal or alkaline earth metal compound, with or without,
(c) boric acid or boric acid ester,
thereby producing a polycarbonate having hydroxy terminal groups not exceeding 30% of the whole terminal groups thereof and an intrinsic viscosity (η) of from 0.3 to 1.0 dl/g, as measured in methylene chloride at a temperature of 20° C.

5,151,492

PROCESS FOR PRODUCING PEROXIDE-VULCANIZABLE, FLUORINE-CONTAINING ELASTOMER

Masatoshi Abe, Kashima, and Haruyoshi Tatsu, Hitachi, both of Japan, assignors to Nippon Mektron, Limited, Tokyo, Japan

Filed Jan. 22, 1992, Ser. No. 824,084
Claims priority, application Japan, Mar. 15, 1991, 3-75793
Int. Cl.[5] C08F *2/38*
U.S. Cl. 526—206 **5 Claims**

1. A process for producing a peroxide-vulcanizable, fluorine-containing elastomer, which comprises homopolymerizing or copolymerizing a fluorine-containing olefin having 2 to 8 carbon atoms in the presence of an iodine and bromine-containing compound represented by the general formula:

RBrnIm

wherein R is a fluorohydrocarbon group, a chlorofluorohydrocarbon group, a chlorohydrocarbon group or a hydrocarbon group, and n and m are integers of 1 and 2, and perfluoro-(unsaturated compound) selected from the group consisting of perfluoro(bromoalkylvinylether) and perfluoro(iodoalkylvinylether).

5,151,493

RADIATION-CURED FILM WEB AND A PROCESS FOR ITS PREPARATION

Hylton H. Smith, Prudhoe, England; Hans F. Huber, Lohmar, Fed. Rep. of Germany, and Hartmut Müller, Little Silver, N.J., assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 13, 1990, Ser. No. 582,653

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1989, 3931890

Int. Cl.[5] C08G *63/20*

U.S. Cl. 528—272 6 Claims

1. A radiation-cured film web composed of a copolyester containing a number of terminal hydroxyl groups which corresponds to hydroxyl numbers of 20 to 100 and 1 to 10 mol. % of trifunctional polyester components in the copolyester chain, based on the total number of polyester components being 100 mo. %, or mixture of copolyesters of this type, said copolyester having a glass transition temperature between −30° and +30° C., a flow point higher than 30° C., and an average molecular weight between 1,000 and 10,000, the terminal hydroxyl groups of said copolyester having been reacted with an acrylate or methacrylate compound, 35 to 90% of the terminal hydroxyl groups having been converted to acrylate groups, in which the optimum degree of acrylation is defined by the empirical formula

$$A_{opt}=50+x-y$$

wherein

A_{opt} is the optimum degree of acrylation as a percentage of the hydroxyl groups of the copolyester which have been reacted with acrylate or methacrylate groups,

x is the numerical value of the difference of 298 minus the glass transition temperature Tg of the copolyester in °K., and

y is the numerical value of the proportion of trifunctional polyester components, in mol. %, based on the total number of polyester components being 100 mol. %, multiplied by 2.

5,151,494

FLAME RESISTANT, LOW PILLING POLYESTER FIBER

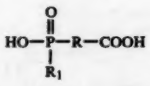
Jerry T. Munday, Charlotte, and Theodore D. Meiss, Matthews, both of N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jan. 4, 1991, Ser. No. 640,132

Int. Cl.[5] C08G *63/68, 79/02*

U.S. Cl. 528—287 18 Claims

1. A polyester which is the polycondensation product consisting essentially of a dicarboxylic acid or a lower alkyl ester thereof, a diol, a chain branching agent having a functionality of at least 3 and a carboxyphosphinic acid monomer, said monomer being used in an amount of from 0.55 to 20 mol percent based on the total amount of dicarboxylic acid or lower alkyl ester thereof and monomer, said monomer of the general formula



or a lower alkyl ester or cyclic anhydride of said monomer wherein R is a saturated, open-chain or cyclic alkylene, arylene or aralkyl having one to 15 carbon atoms, and R_1 is an alkyl having up to 6 carbon atoms, aryl or aralkyl wherein the polycondensation product has an intrinsic viscosity of less than about 0.55 deciliters/gm in the solvent base dichloroacetic acid at 25° C.

5,151,495

PROCESS FOR PRODUCING POLY (PARA-PHENYLENE-SULFIDE)

Hiroshi Inoue; Toshikazu Kato, and Kensuke Ogawara, all of Mie, Japan, assignors to Tosoh Corporation, Yamaguchi and Toso Susteel Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 285,978, Dec. 19, 1988, abandoned. This application Nov. 5, 1990, Ser. No. 609,141

Claims priority, application Japan, Dec. 18, 1987, 62-318920

The portion of the term of this patent subsequent to Aug. 6, 2008, has been disclaimed.

Int. Cl.[5] C08G *75/14*

U.S. Cl. 528—388 10 Claims

1. A process for producing a substantially linear poly (p-phenylenesulfide) which comprises providing a mixture comprising an alkali metal sulfide, a polar aprotic solvent, a sodium salt of an aliphatic carboxylic acid represented by the general formula: RCOONa (where R is an aliphatic hydrocarbon group having 1–20 carbon atoms), the content of water present in said mixture apart from any water of hydration of crystallization which may be contained in said sulfide and sodium salt being in the range of 5 to 20 moles per mole of said sulfide;

thermally dehydrating said sulfide component in said mixture by removing at least part of the water from said mixture; and

then contacting the resulting dehydrated mixture with a p-dihalobenzene so as to form the desired said poly (p-phenylenesulfide), wherein the preparation of said mixture of alkali metal sulfide and said dehydration step occurs at atmospheric pressure and said poly (p-phenylenesulfide) contains no tri- or higher functional units providing branching sites.

5,151,496

SUBSTITUTED PHENOL-FORMALDEHYDE NOVOLAC RESINS CONTAINING REDUCED QUANTITIES OF 2-FUNCTIONAL COMPONENTS AND EPOXY NOVOLAC RESINS PREPARED THEREFROM

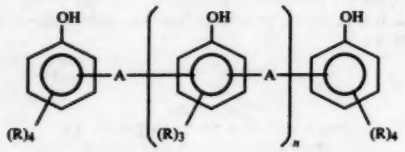
James L. Bertram, Lake Jackson; Louis L. Walker, Clute; Avis L. McCrary, and Fermin M. Cortez, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 658,968, Feb. 21, 1991, Pat. No. 5,106,923, which is a continuation of Ser. No. 545,314, Jun. 27, 1990, abandoned, which is a division of Ser. No. 440,550, Nov. 17, 1989, Pat. No. 4,965,324, which is a continuation-in-part of Ser. No. 186,272, Apr. 26, 1988, abandoned, which is a division of Ser. No. 16,046, Feb. 18, 1987, Pat. No. 4,755,568, which is a continuation-in-part of Ser. No. 690,702, Jan. 11, 1985, abandoned. This application Dec. 18, 1991, Ser. No. 823,636

Int. Cl.[5] C08G *59/08*

U.S. Cl. 528—500 14 Claims

1. A novolac resin which results from removing at least about 25 weight percent of the 2-functional component from a novolac resin having an average functionality greater than 2 which results from reacting (1) a material having at least one aromatic hydroxyl group per molecule selected from the group consisting of (a) a substituted phenol wherein the substituent groups are hydroxyl, hydrocarbyl or hydrocarbyloxy groups having from 1 to about 9 carbon atoms, or a halogen; and (b) a mixture of said substituted phenol and phenol wherein more than about 50 molar percent of the mixture is a substituted phenol; with (2) an aldehyde; said novolac resin being represented by the formula



wherein each A is independently a divalent hydrocarbon group or a divalent hydrocarbon group substituted with any inert substituent group; each R is independently hydrogen, a halogen atom, a hydroxyl group or a hydrocarbon or hydrocarbyloxy group having from 1 to about 4 carbon atoms; and n has an average value of from 1 to about 10 with the proviso that more than 50 percent of the aromatic rings have at least one R group which is other than hydrogen.

5,151,497

HISTIDYL PEPTIDE DERIVATIVES

Itsuo Uchida; Akira Saito; Akihiro Yasuda, all of Yokohama; Kunio Iwata, Hatano; Hiroaki Hari, Tokushima; Katsuyoshi Hara, Yokohama; Mutsuyoshi Matsushita, Hatano; Koretake Anami, Nakatsu; Junichi Haruta, Yokohama, and Noboru Furukawa, Hatano, all of Japan, assignors to Japan Tobacco Inc., Tokyo and Yoshotomi Pharmaceutical Industries, Ltd., Osaka, both of, Japan

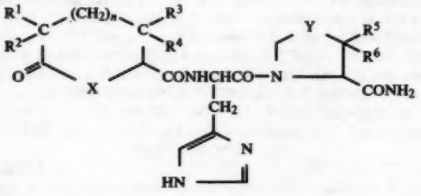
Continuation-in-part of Ser. No. 481,559, Feb. 20, 1990, abandoned, and a continuation-in-part of Ser. No. 517,035, May 1, 1990, abandoned, and a continuation-in-part of Ser. No. 571,099, Aug. 21, 1990, abandoned. This application Jul. 12, 1991, Ser. No. 729,415

Claims priority, application Japan, Aug. 17, 1990, 2-215752

Int. Cl.[5] A61K *37/02*; C07K *5/08*

U.S. Cl. 530—331 **11 Claims**

1. A peptide derivative of the following formula



wherein R^1 and R^2 are the same or different and respectively means a hydrogen atom or a C_{1-5} alkyl group, R^3 and R^4 are the same or different and respectively mean a hydrogen atom or a C_{1-5} alkyl group or phenyl, or R^3 and R^4 combinedly means a C_{2-7} alkylene group, R^5 and R^6 are the same or different and respectively mean a hydrogen atom or a C_{1-5} alkyl group, X means —NH— or —O—, Y means $—CH_2—$ or —S—, and n means 0 or 1, provided that all of R^1, R^2, R^3 and R^4 do not mean hydrogen atoms at the same time, or a pharmaceutically acceptable acid addition salt thereof.

5,151,498

GLYCOPROTEIN FROM *AVENA SATIVA*, PROCESS FOR ITS PREPARATION, AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

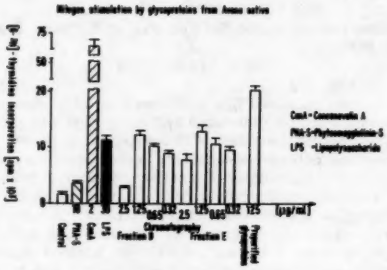
Norbert Beuscher, Salzgitter Bad, and Karl-Heinz Schelt, Goettingen, both of Fed. Rep. of Germany, assignors to Schaper & Bruemmer GmbH & Co. KG, Salzgitter, Fed. Rep. of Germany

Filed Apr. 30, 1990, Ser. No. 515,517

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1989, 3914354

Int. Cl.[5] A61K *37/02*; C07K *3/02, 15/10, 15/14*

U.S. Cl. 530—372 **21 Claims**



1. An *Avena sativa* glycoprotein that migrates as a single band during SDS electrophoresis, said glycoprotein having a molecular weight of 38 kD and mitogenic activity.

5,151,499

PRODUCTION METHOD FOR PROTEIN-CONTAINING COMPOSITION

Shoju Kameyama; Kenmi Miyano; Motonori Hashimoto; Kazuo Takechi; Takao Ohmura; Yutaka Hirao; Yahiro Uemura, and Kazumasa Yokoyama, all of Hirakata, Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Jan. 12, 1990, Ser. No. 464,077

Claims priority, application Japan, Jan. 13, 1989, 1-6736; Nov. 27, 1989, 1-308466

Int. Cl.[5] A61K *35/16, 35/14, 39/18, 37/00*

U.S. Cl. 530—381 **16 Claims**

1. A method for preparing a virus-inactivated protein-containing composition from a protein-containing composition which may be contaminated with virus and which composition is treated in a liquid state and in a dry state, comprising the steps of (a) contacting the protein-containing composition in a liquid state with a trialkyl phosphate, and (b) heat-treating the protein-containing composition in a dry state to the extent that a non-envelope virus contained therein is inactivated, wherein the steps (a) and (b) are performed in any order.

5,151,500

PROCESS FOR PRODUCING A SUBSTANTIALLY HEME-FREE BLOOD PROTEIN

Jorgen Wismer-Pedersen, deceased, late of Roskilde, and Jorn Frohlich, legal representative, Advokatfirmaet Kielberg, Hunderupvej 71, DK-5100 Odense C, both of Denmark

PCT No. PCT/DK88/00127, § 371 Date Mar. 29, 1990, § 102(e) Date Mar. 29, 1990, PCT Pub. No. WO89/00816, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 26, 1988, Ser. No. 469,557

Claims priority, application Denmark, Jul. 30, 1987, 3989/87

Int. Cl.[5] A61K *35/14*; A23J *1/06*; C07K *3/24*

U.S. Cl. 530—385 **9 Claims**

1. A process for producing a substantially heme-free blood protein product wherein said process comprises the steps of:

(A) adding a strong acid to a blood cell suspension to produce a pH of about 1.0 to 3.5 whereby a heme moiety is

cleaved from majority of the hemoglobin in said suspension and said heme moiety forms a precipitate,

(B) removing said precipitate thereby producing a blood protein-containing solution,

(C) adjusting said blood protein-containing solution to a pH of about 4 to 5 by addition of a base, and

(D) degrading remaining heme moieties in said blood protein-containing solution by adding an amount of an oxidizing agent sufficient to degrade said remaining heme moieties.

5,151,501

METHOD FOR SOLUBILIZATION AND NATURATION OF SOMATOTROPINS UTILIZING SULFOLANE

Kevin M. McCoy, Hoboken, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 20, 1991, Ser. No. 811,494

Int. Cl.[5] C07K *3/12, 15/06*

U.S. Cl. 530—399 **15 Claims**

1. A process for solubilization and naturation of somatotropins, said process comprising: dispersing somatotropin refractrile bodies in an aqueous solution of about 2.5 to 3.5 M sulfolane at a pH and for sufficient time to solubilize said refractile bodies and then diluting said solution at least three-fold with water at a pH and for a time sufficient to result in properly folded monomeric somatotropin.

5,151,502

METHOD FOR SOLUBILIZING MEMBRANE RECEPTOR PROTEINS

Maria L. Webb, Neshanic Station, and Hossain Monshizadegan, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 30, 1991, Ser. No. 693,501

Int. Cl.[5] C07K *3/00, 3/02*

U.S. Cl. 530—402 **5 Claims**

1. A method for solubilizing membrane receptor proteins which are targets of reducing agents, said membrane receptor proteins being selected from the group consisting of angiotensin II receptor protein, thromboxane receptor protein and neuropeptide Y receptor protein, which comprises:

a. exposing an outer membrane having said receptor protein to an oxidizing agent;

b. treating said membrane with a detergent to extract and solubilize said protein; and

c. treating the membrane derived proteins with an inhibitory material lowering agent, said agent being a polymeric macroporous bead having a neutral charge.

5,151,503

PROCESS FOR REDUCING HYDROLYSED PROTEIN CHLOROHYDRIN CONTENT

Roland Fäsi, Bruetten, Switzerland, and Milo A. Nielsen, Granada Hills, Calif., assignors to Nestec S.A., Vevey, Switzerland

Filed Mar. 28, 1991, Ser. No. 676,899

Int. Cl.[5] C07K *3/12, 3/28*

U.S. Cl. 530—412 **12 Claims**

1. A process for reducing chlorohydrin content of hydrolysed protein comprising:

passing a flow of liquid, wherein the liquid comprises hydrolysed protein obtained by hydrolysis of protein with hydrochloric acid, under a pressure greater than atmospheric pressure through a system piping means for containing the flowing pressurized liquid;

introducing a quantity of alkali into the flowing pressurized liquid and mixing the alkali and liquid to increase the pH of the liquid and obtain a flowing pressurized pH-increased liquid;

heating the flowing pressurized pH-increased liquid to a temperature of from about 100° C. to 170° C.;

maintaining the temperature of the heated flowing pressurized pH-increased liquid at the temperature of from about 100° C. to 170° C. for a time sufficient for reducing the chlorohydrin content of hydrolysed protein contained in the pH-increased liquid to obtain a flowing pressurized chlorohydrin-reduced liquid; and

cooling the flowing pressurized chlorohydrin-reduced liquid to a temperature below 100° C. so that cooling is sufficient to suppress and substantially avoid ammonia gas evolution form the cooled liquid; and

releasing the pressure form the piping system means and the cooled liquid; and

collecting the liquid from which the pressure has been released.

5,151,504

METHOD FOR PURIFICATION OF MONOCLONAL ANTIBODIES

Edward M. Croze, San Ramon, Calif., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 438,548, Nov. 17, 1989. This application Mar. 26, 1990, Ser. No. 500,340

Int. Cl.[5] C07K *3/18, 3/28*

U.S. Cl. 530—413 **16 Claims**

1. An improved method for the purification of antibodies of the Class IgG or antibody fragments of the class IgG comprising:

(a) applying a preparation containing antibodies of the Class IgG or antibody fragments of the class IgG to an absorbant which removes contaminants from the preparation;

(b) eluting the antibodies of the Class IgG or antibody fragments of the class IgG from the absorbant;

(c) absorbing the antibodies of the Class IgG or antibody fragments of the class IgG onto Protein G bound to a substrate;

(d) eluting the antibodies of the Class IgG or antibody fragments of the class IgG from the substrate bound Protein G with a solution of alkaline pH; and

(e) recovering the purified antibodies of the Class IgG or antibody fragments of the class IgG, wherein the purified antibodies fragments of the class IgG, wherein the purified antibodies or antibody fragments retain the ability to bind antigen.

6. The method according to claim 5 wherein the pH of the eluant used to elute the antibodies of the Class IgG or antibody fragments of the class IgG from the substrate bound Protein G is about 9.5.

5,151,505

AMINE SALTS OF AZO PIGMENTS BASED ON PYRAZOLONE DERIVATIVES

Stefan Hari, Villars-sur-Glane, and Georg Cseh, Posat, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

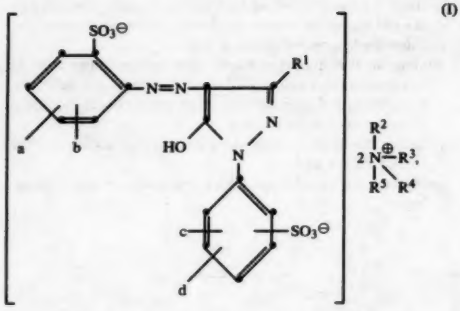
Division of Ser. No. 207,414, Jun. 16, 1988, Pat. No. 4,992,495, which is a continuation of Ser. No. 20,059, Feb. 27, 1987, abandoned. This application Nov. 13, 1990, Ser. No. 612,764

Claims priority, application Switzerland, Mar. 10, 1986, 961/86

Int. Cl.[5] C09B *29/03, 29/10*; D06P *1/44, 5/00*

U.S. Cl. 534—728 **2 Claims**

1. A compound of formula I



(I)

wherein

a and b are each —Cl,

c and d are each independently of the other hydrogen, —Cl or —CH_3,

R^1 is —CH_3, and

R^2, R^3, R^4 and R^5 are each hydrogen.

5,151,506

PHENONEAZO DYES

Volker Bach, Neustadt; Guenter Hansen, Ludwigshafen; Gunther Lamm, Hassloch, and Ruediger Sens, Mannheim, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

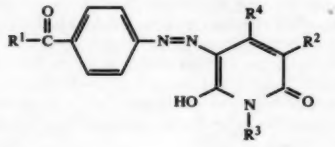
Filed Aug. 16, 1990, Ser. No. 568,087

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1989, 3927069

Int. Cl.[5] C09B *29/42*

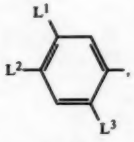
U.S. Cl. 534—772 **4 Claims**

1. A phenoneazo dye of the formula I



where

R^1 is a radical of the formula



where L^1, L^2 and L^3 are identical or different and each is independently of the others hydrogen, C_1–C_4-alkyl or C_1–C_4-alkoxy,

R^2 is cyano, carbamoyl or acetyl,

R^3 is C_4-alkyl or C_3–C_{12}-alkyl which is interrupted by from 1 to 3 oxygen atoms and may be substituted by C_1–C_4-alkanoyloxy, cyclohexyloxy, phenoxy which may be C_1–C_4-alkoxy-substituted or phenyl, and

R^4 is hydrogen or C_1–C_4-alkyl,

with the proviso that

(a) L^1, L^2, and L^3 are not all hydrogen at one end and the same time, and

(b) when two members of the set L^1, L^2, and L^3 are hydrogen, the third member is C_1–C_4-alkoxy.

5,151,507

ALKYNYLAMINO-NUCLEOTIDES

Frank W. Hobbs, Jr., and George L. Trainor, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

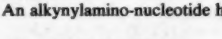
Continuation-in-part of Ser. No. 57,565, Jun. 12, 1987, Pat. No. 5,047,519, which is a continuation-in-part of Ser. No. 881,372, Jul. 2, 1986, abandoned. This application Jun. 12, 1991, Ser. No. 713,906

The portion of the term of this patent subsequent to Sep. 10, 2008, has been disclaimed.

Int. Cl.[5] C07H *1/00*

U.S. Cl. 536—23 **9 Claims**

1. An alkynylamino-nucleotide having the structure:

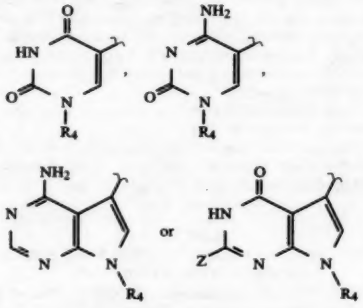


wherein

R_1 is —$CH_2OCH_2(CH_2OCH_2)_nCH_2$— and n=2-5

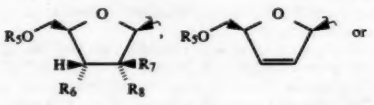
R_2 and R_3 are, independently, H, C_1–C_4 alkyl or a protecting group, and

Nuc is R_4-Het having the structure



Z is H or NH_2, and

R_4 is



wherein

R_5 is H, PO_3H_2, $P_2O_6H_3$, $P_3O_9H_4$ or salts thereof, and

(i) when R_7=R_8=H, then R_6=H, OH, F, N_3 or NH_2; or

(ii) when R_7=H and R_8=OH, then R_6=H or OH; or

(iii) when R_7=OH and R_8=H, then R_6=OH.

5,151,508

PROMOTER REGION FOR DNA SEQUENCES WHICH ENCODE THE PRECURSOR OF THE HUMAN A4 AMYLOID PROTEIN

Johannes M. H. Salbaum, Waldkirchen, Fed. Rep. of Germany; Colin L. Masters, Darlington, Australia, and Konrad T. Beyreuter, Heidelberg, Fed. Rep. of Germany, assignors to Molecular Therapeutics, Inc., West Haven, Conn.

Continuation-in-part of Ser. No. 385,758, Jul. 26, 1989, abandoned. This application Aug. 14, 1989, Ser. No. 393,360

Claims priority, application United Kingdom, Aug. 30, 1988, 8820450

Int. Cl.[5] C07H *15/12*; C12N *15/00*

U.S. Cl. 536—27 **8 Claims**

1. The promoter region for DNA sequences which encode the precursor of the human A4 amyloid protein which regulates expression of said DNA sequences.

5,151,509

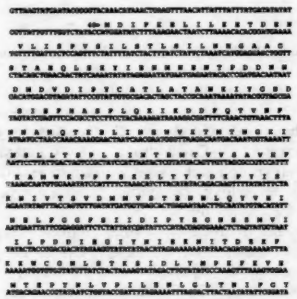
GENE ENCODING SERINE PROTEASE INHIBITOR

Girish J. Kotwal, and Bernard Moss, both of Bethesda, Md., assignors to United States of America, Washington, D.C.

Filed Dec. 16, 1988, Ser. No. 285,510

Int. Cl.[5] C12N *15/15*

U.S. Cl. 536—27 **2 Claims**



1. A cloned gene having the nucleotide sequence of FIG. 2A.

5,151,510

METHOD OF SYNETHESIZING SULFURIZED OLIGONUCLEOTIDE ANALOGS

Wojciech J. Stec; Bogdan Uznanski, both of Lodz, Poland; B. John Bergot, Redwood City, Calif.; Bernard L. Hirschbein, San Francisco, Calif., and Karen L. Fearon, Union City, Calif., assignors to Applied Biosystems, Inc., Foster City, Calif.

Filed Apr. 20, 1990, Ser. No. 512,644

Int. Cl.[5] C07H *15/12, 17/00*; A01N *43/04*; C12Q *1/68*

U.S. Cl. 536—27 **17 Claims**

1. A method of synthesizing an oligonucleotide phosphorothioate or phosphorodithioate of a predetermined sequence, the method comprising the steps of:

(a) providing a protected nucleoside or analog thereof attached to a solid phase support, the protected nucleoside or analog thereof having a blocked hydroxyl;

(b) deblocking the blocked hydroxyl to form a free hydroxyl;

(c) reacting with the free hydroxyl a blocked protected nucleoside phosphoramidite or phosphorthioamidite monomer or analog thereof to form a correct-sequence chain having a phosphorous(III) linkage and a blocked hydroxyl;

(d) sulfurizing the phosphorous(III) linkage by exposing the correct-sequence chain to a thiophosphorus compound selected from the group consisting of thiophosphoric acid polysulfide dithiophosphoric acid polysulfide, and dithiophosphinic acid polysulfide;

(e) repeating steps (b) through (d) until the oligonucleotide phosphorothioate or phosphorodithioate of the predetermined sequence is obtained.

5,151,511

DNA ENCODING AVIAN GROWTH HORMONES

Lawrence M. Souza, Thousand Oaks, and Thomas C. Boone, Newbury Park, both of Calif., assignors to Amgen Inc., Thousand Oaks, Calif.

Continuation of Ser. No. 690,463, Jan. 10, 1985, abandoned, which is a division of Ser. No. 529,879, Sep. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 418,846, Sep. 16, 1982, abandoned. This application Jan. 27, 1988, Ser. No. 148,110

Int. Cl.[5] C12N *15/18*

U.S. Cl. 536—27 **2 Claims**

1. A purified and isolated DNA sequence coding for expression of chicken growth hormone polypeptide.

5,151,512

INTERMEDIATES FOR PREPARING 2-(SUBSTITUTED-DIBENZOFURANYL AND DIBENZOTHIENYL) CARBAPENEM ANTIBACTERIAL AGENTS

Frank P. DiNinno, Old Bridge; Mark L. Greenlee, Rahway, and Thomas N. Salzmann, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 15, 1990, Ser. No. 597,648

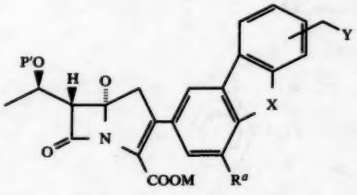
The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.

Int. Cl.[5] C07D *487/04*; C07F *7/08*; A61K *31/40*

U.S. Cl. 540—302 **4 Claims**

1. A compound of the formula:

(I.'')



wherein;

R^a is selected from the group consisting of H, Cl, Br, I, SCH_3, CN, CHO, $SOCH_3$, SO_2CH_3, CO_2M, $CONH_2$, OP' and CH_2OP';

P' is a removable protecting group for hydroxy;

M is a removable protecting group for carboxy;

X is O or $S(O)_{0-2}$; and

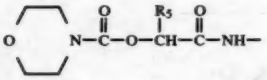
Y is a leaving group selected from the group consisting of alkylsulfonyloxy, substituted alkylsulfonyloxy, arylsulfonyloxy, substituted arylsulfonyloxy, fluorosulfonyloxy, and halogen.

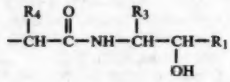
5,151,513
N-HETEROCYCLIC ALCOHOL DERIVATIVES

Harold N. Weller, III, Pennington, and Denis E. Ryono, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

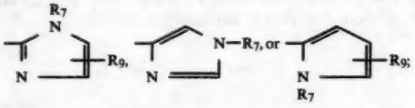
Filed Apr. 29, 1988, Ser. No. 187,782
Int. Cl.[5] C07D *413/12*
U.S. Cl. 544—139 3 Claims

1. A compound of the formula

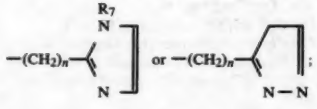




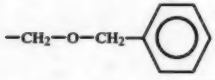
wherein
R_1 is



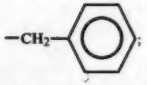
R_3 is hydrogen, lower alkyl, halo substituted lower alkyl or $-(CH_2)_n$-cycloalkyl;
R_4 is hydrogen, lower alkyl, halo substituted lower alkyl,



R_5 is hydrogen, lower alkyl, halo-substituted lower alkyl or $-(CH_2)_n$-aryl;
R_7 is hydrogen, alkyl,



or



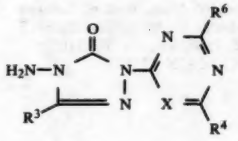
R_9 is hydrogen, lower alkyl or $-(CH_2)_n$cycloalkyl; and n=1–3.

5,151,514
HERBICIDAL SUBSTITUTED 4-SULPHONYLAMINO-2-AZINYL-1,2,4-TRIAZOL-3-ONES

Klaus-Helmut Müller, Duesseldorf; Rolf Kirsten, Monheim; Joachim Kluth, Langenfeld; Klaus König, Odenthal; Hans-Jochem Riebel; Peter Babczinski, both of Wuppertal; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch Gladbach, and Harry Strang, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 583,915, Sep. 17, 1990, Pat. No. 5,085,697, which is a division of Ser. No. 382,163, Jul. 19, 1989, Pat. No. 4,988,381. This application Oct. 28, 1991, Ser. No. 783,586
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825602; Jan. 16, 1989, 3901084
Int. Cl.[5] C07D *403/04*
U.S. Cl. 544—212 6 Claims

1. A compound of the formula



in which
R^3 represents hydrogen, fluorine, chlorine, bromine, iodine, hydroxyl, mercapto, amino or an optionally fluorine- and/or chlorine-substituted radical selected from the group consisting of C_1–C_4-alkyl, C_3–C_6-cycloalkyl, benzyl, phenyl, C_1–C_4-alkoxy, C_3–C_4-alkenyloxy, C_3–C_4-alkinyloxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, C_3–C_4-alkenylthio, C_3–C_4-alkinylthio, benzyloxy, benzylthio, C_1–C_4-alkylamino and di-(C_1–C_4-alkyl)-amino,
R^4 represents hydrogen, fluorine, chlorine, bromine, hydroxyl, amino, C_1–C_4-alkyl, C_1–C_4-halogenoalkyl, C_1–C_2-alkoxy-C_1–C_2-alkyl, C_1–C_4-alkoxy, C_1–C_4-halogenoalkoxy, C_1–C_2-alkoxy-C_1–C_2-alkoxy, C_1–C_4-alkylthio, C_1–C_4-halogenoalkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, C_1–C_4-alkylamino or di-(C_1–C_2-alkyl)-amino, and
R^6 represents hydrogen, fluorine, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-halogenoalkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, C_1–C_4-alkylamino, dimethylamino or diethylamino,
or a salt thereof.

5,151,515
OXYGEN REDUCTION CATALYST BASED UPON METAL DIPYRIDYLAMINES

Alan J. Cisar, Sugar Land, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 4, 1991, Ser. No. 650,355
Int. Cl.[5] C07F *15/06*; B01J *31/18*; H01M *4/88*
U.S. Cl. 546—12 2 Claims

1. The compound Bis-di-2,2'-pyridylamine cobalt (II) chloride.

2. The compound Bis-di-2,2'-pyridylamine cobalt (II) acetate.

5,151,516
POLYMERIZABLE PERYLENE-3,4,9,10-TETRACARBIMIDES

Karin H. Beck, Ludwigshafen; Karl-Heinz Etzbach, Frankenthal, all of Fed. Rep. of Germany, and Hans-Werner Schmidt, Goleta, Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

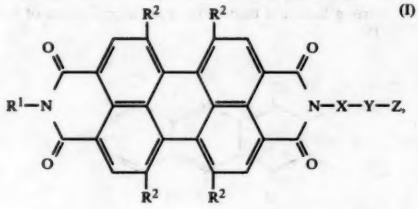
Filed Oct. 12, 1990, Ser. No. 598,004

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1989, 3934329

Int. Cl.[5] C07D *221/22*

U.S. Cl. 546—37 **3 Claims**

1. A perylimide of the formula



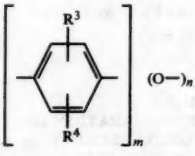
(I)

where

R^1 is C_1–C_{20}-alkyl, which may be interrupted by one or more oxygen atoms, or is phenyl which is monosubstituted or polysubstituted by C_1–C_{13}-alkyl or C_1–C_{13}-alkoxy,

R^2 is identical or different at each of its appearances, each appearance of R^2 being independently of the others hydrogen, chlorine, phenoxy or halogen-, C_1–C_4-alkyl- or C_1–C_4-alkoxy-substituted phenoxy,

X is a chemical bond or a radical of the formula



where R^3 and R^4 are identical or different and each is independently of the other hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen, m is 1 or 2 and n is 0 or 1,

Y is C_8–C_{24}-alkylene, and

Z is vinyl or a radical of the formula W—CO—C(R^5)=CH_2, where R^5 is hydrogen, methyl or chlorine and W is oxygen, imino or C_1–C_4-alkylimino.

5,151,517
DERIVATIVES OF TETRAHYDRO-2,3,6,7,1H,5H,11H-(1)BENZOPYRANO(6,7,8,I,J)QUINOLIZINONE-11 USABLE AS MARKERS FOR ORGANIC COMPOUNDS, PARTICULARLY BIOLOGICAL COMPOUNDS WITH A VIEW TO THEIR DETECTION BY CHEMILUMINESCENCE OR FLUORESCENCE

Pierre Reveilleau; Georges Mahuzier; Joseph Chalom, all of Paris; Robert Farinotti, Champigny s/Marne; Michel Tod, Margency, and Edith Barre, Paris, all of France, assignors to Laboratories Eurobio, Les Ulis Cedex, France

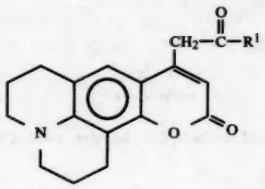
Filed Nov. 27, 1990, Ser. No. 619,189

Claims priority, application France, Nov. 30, 1989, 89 15789

Int. Cl.[5] C07D *491/147*

U.S. Cl. 546—66 **10 Claims**

1. Compound in accordance with the formula:

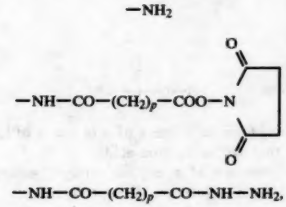


(I)

in which R^1 represents:

1) —NH—$(CH_2)_n$—R^2 with n being an integer from 1 to 20 and R^2 representing —N=C=S or NH—CO—CH_2X with X representing I, Br or Cl, or

2) —NH—(CH_2—CH_2—O)m—CH_2—CH_2—R^3 with m being an integer from 1 to 30 and R^3 representing a group chosen from among those of formula



—NH—CO—$(CH_2)_p$—CO—NH—NH_2,

—N=C=S, and

—NH—CO—CH_2X

in which p is an integer from 1 to 10 and X represents I, Br or Cl.

5,151,518
N-ARYLATION OF ISATINS

James E. Dombrowski, Portland, Me., and Phillip G. Mattingly, Grayslake, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

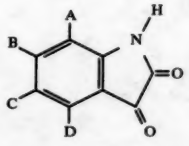
Continuation of Ser. No. 271,799, Nov. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 104,715, Oct. 2, 1987, abandoned. This application Nov. 30, 1989, Ser. No. 443,869

Int. Cl.[5] C07D *219/04, 209/38*

U.S. Cl. 546—107 **8 Claims**

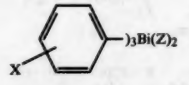
1. A process for N-arylation of isatins, comprising:

(a) reacting a compound of formula I wherein A,B,C, and D are selected independently in each instance from hydrogen, halogen, cyano, nitro, amino, carboxy, sulfone, alkyl, and alkoxy, or B and C together can form a fused aromatic ring;



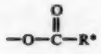
I

(b) with a compound of formula II:

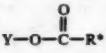


II

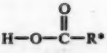
wherein Z is a halogen or a substituent of formula



with the proviso that where Z is a halogen, a salt of the formula



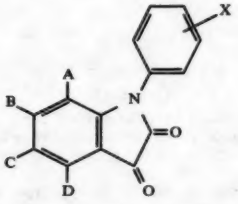
is added to the reaction of compounds I and II where Y is a group I or group II metal, and R^* in each instance is selected from a group such that the conjugate acid



of the group of formula II has a pKa in water of less than 5.0 and is other than trifluoroacetic acid;

(c) in the presence of a copper catalyst; whereby an N-arylated isatin of formula III is produced;

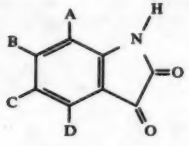
III



5. A process of producing an intermediate of formula IV, comprising:

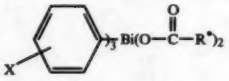
(a) reacting a compound of formula I;

I



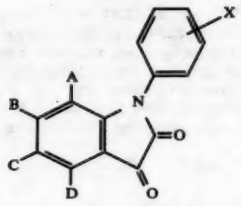
(b) with a compound of formula II;

II



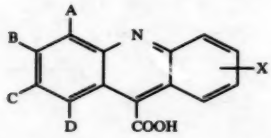
(c) in the presence of a copper catalyst to produce an N-arylated isatin of formula III;

III

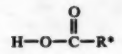


(d) and treating the N-arylated isatin of formula III with a strong base and heat to produce a compound of formula IV:

IV



wherein A,B,C, and D are selected independently in each instance from hydrogen, halogen, cyano, nitro, amino, carboxy, sulfone, alkyl, and alkoxy, or B and C together can form a fused aromatic ring; wherein X is selected from hydrogen, halogen, nitro, cyano, alkyl, and alkoxy; and R^* is selected from a group such that the conjugate acid



of the group of formula II has a pKa in water of less than 5.0 and is other than trifluoroacetic acid.

5,151,519

PROCESS FOR THE PREPARATION OF 1,5-(ALKYLIMINO)-1,5-DIDEOXY-D-GLUCITOL AND DERIVATIVES THEREOF

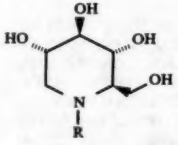
James R. Behling, Lindenhurst; Payman Farid, Deerfield; Ish Khanna, Vernon Hills; John R. Medich, Des Plaines; Mike Prunier, Vernon Hills; Mike G. Scaros, Arlington Heights, and Richard M. Weier, Lake Bluff, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 7, 1990, Ser. No. 521,282

Int. Cl.[5] C07D *211/46*

U.S. Cl. 546—219 **45 Claims**

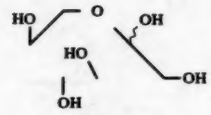
1. A method for the preparation of a compound of the formula I



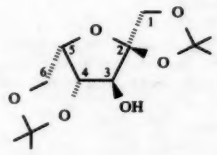
wherein R is hydrogen, alkyl of 1 to 13 carbon atoms, and aralkyl wherein alkyl is lower alkyl of 2 to 6 carbon atoms, and aryl is phenyl, unsubstituted or substituted with lower alkyl of 1 to 6 carbon atoms, halo, lower alkoxy of 1 to 4 carbon atoms or thio lower alkyl of 1 to 4 carbon atoms

which method comprises:

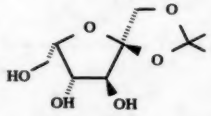
a) reacting a compound of the formula



with 2,2-dimethoxypropane in the presence of stannous chloride and a substantially pure solvent provided that if the solvent is not substantially pure, then the reaction is carried out in the presence of a combination of stannous chloride and a zinc salt, to produce a compound of the formula



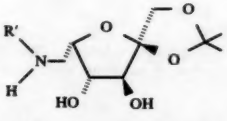
b) treating the product of step a) with aqueous sulfuric acid in the presence of a solvent to produce a compound of the formula



c) consecutively treating the product of step b) with a sulfonyl chloride in the presence of a base and with an amine of the formula

$R'—NH_2$

wherein R′ is R as defined above or a benzyl group, to produce a compound of the formula



wherein R′ is again as defined above;

d) adsorbing the compound produced in step c) on an ion exchange resin; and

e) hydrogenating said compound while adsorbed on the ion exchange resin and in the presence of a hydrogenation catalyst to yield the desired compound of formula I.

5,151,520

CATIONIC DYE-TRIARYLMONOALKYLORATE ANION COMPLEXES

Peter Gottschalk, Centerville; Douglas C. Neckers, Perrysburg, both of Ohio, and Gary B. Schuster, Champaign, Ill., assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 180,915, Apr. 13, 1988, Pat. No. 4,977,511, which is a continuation-in-part of Ser. No. 944,305, Dec. 18, 1986, Pat. No. 4,772,530, which is a continuation-in-part of Ser. No. 860,367, May 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 800,014, Nov. 20, 1985, abandoned. This application Jan. 30, 1990, Ser. No. 472,998

Int. Cl.[5] C09B *23/01, 57/14;* **A61K** *6/00*

U.S. Cl. 548—110 **12 Claims**

1. A compound represented by the formula (I):

(I)

where D+ is a cationic dye moiety selected from the group consisting of cationic cyanine, carbocyanine, dicarbocyanine, tricarbocyanmine, hemicyanine, rhodamine, and azamethine dyes; R^1 is alkyl; and R^2, R^3, and R^4 are aryl.

5,151,521

1-AMINOETHYL PHOSPHONIC ACID DERIVATIVES

Yoshiharu Morita; Haruyuki Chaki, both of Yokohama; Yasuo Hoshide, Okegawa; Junko Takashima, Yokohama, all of Japan, and Arthur A. Patchett, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

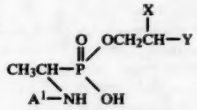
Division of Ser. No. 529,698, May 24, 1990, Pat. No. 5,061,806, which is a continuation of Ser. No. 211,658, Jun. 27, 1988, abandoned. This application Jun. 12, 1991, Ser. No. 714,423

Claims priority, application Japan, Jul. 6, 1987, 610354

Int. Cl.[5] C07F *9/40*

U.S. Cl. 548—112 **4 Claims**

1. A compound represented by the Formula (I):

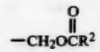


(I)

wherein A^1 is a hydrogen atom, or, a residue consisting of one or two amino acids optionally having a protecting group which is obtained by removing, from an oligopeptide optionally having a protecting group, the hydroxy group of the terminal carboxyl group; X is (a) a hydroxyl group,

(b)

wherein R^1 is an alkyl group, or (c) —NHA^2 wherein A^2 is a hydrogen atom, or a residue consisting of one or two amino acids optionally having a protecting group which is obtained by removing, from the amino acid or dipeptide optionally having a protecting group, the hydroxyl group of the terminal carboxyl group, or a protecting group for the amino group; and Y is (a) —CH_2OH,



(b)

wherein R^2 is an alkyl group, or

(c)

wherein B is a hydroxyl group, or a residue consisting of one or two amino acids optionally having a protecting group obtained by removing, from the amino acid or dipeptide optionally having a protecting group, the hydrogen atom of the terminal group, or a protecting group for the carboxyl group provided that at least one of A^1, A^2, or B is a dipeptide residue.

5,151,522

PROCESS FOR PREPARING POLYCARBOXYLIC ACID IMIDAZOLINES BY CONDENSATION REACTION

Hans Hitz; Rolf Schaefer, both of Arisdorf, Switzerland; Heinrich Baust, Plankstadt, and Wolfgang Gross, Mutterstadt, both of Fed. Rep. of Germany, assignors to Chemisches Institut Schaefer AG, Bubendorf, Switzerland and Joh. A. Benckiser GmbH, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 535,135, Jun. 8, 1990, Pat. No. 5,049,315. This application Jul. 22, 1991, Ser. No. 733,851

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1989, 3919863

Int. Cl.[5] C07D *233/02*

U.S. Cl. 548—112 **3 Claims**

1. A process for preparing a polycarboxylic acid imidazoline compound of the formula

in which

X is —Cl, —OH, —OSO_3H, —OPO_3H_2, —O—CH_2—CH_2—COOH, —NH_2, —NH(alk) or —$N(alk)_2$,

alk is an alkyl radical containing 1 to 6 carbon atoms,

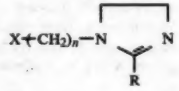
n is a whole number from 2 to 4,

m is a whole number from 2 to 5,

R is a C_{8-18} hydrocarbon chain which is straightchain or branched, and saturated or 1 to 3 times unsaturated,

R′ is H or a carboxyl group, and

R″ is H or —CH_3, which comprises the step of condensing a compound of the general formula



in which R, X and n are as defined above, with about a 2-to 5-fold excess of acrylic acid, methacrylic acid, maleic acid, or a mixture thereof.

5,151,523

PREPARATION OF 2-METHYLBENZOXAZOLE

Manfred Gaeng, Bobenheim-Roxheim; Heinz Saukel, Friedelsheim; Wolfgang Hoffmann, Frankenthal, and Josef Koenig, Zellertal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 11, 1991, Ser. No. 667,111

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1990, 4009027

Int. Cl.[5] C07D *263/56*

U.S. Cl. 548—217 **3 Claims**

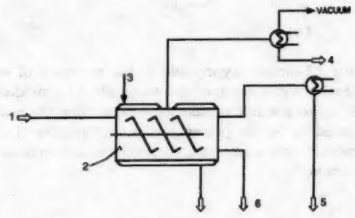
1. In the process of preparing 2-methylbenzoxazole by the cyclization of acetamidophenol, the improvement consisting essentially of:

preparing a filtercake of acetamidophenol which is wet with water;

feeding the wet filtercake into a dryer;

drying the filtercake;

melting the dried filtercake;



simultaneously with the melting step, cyclizing the acetamidophenol to 2-methylbenzoxazole with the elimination of water of reaction;

removing the water of reaction by distillation during the cyclization step, starting at atmospheric pressure and reducing the pressure during the cyclization step;

removing the formed 2-methylbenzoxazole by distillation to leave a residue; and

removing the residue from the dryer.

5,151,524

PROCESS FOR PREPARING IMIDAZOLIDINE-2,5-DIONE DERIVATIVE

Tetuya Imai, Naruto, Japan, assignor to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

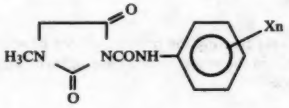
Filed Jul. 18, 1990, Ser. No. 553,519

Claims priority, application Japan, Jul. 19, 1989, 1-187064; Feb. 27, 1990, 2-48030

Int. Cl.[5] C07D *235/30*

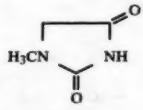
U.S. Cl. 548—307 **3 Claims**

1. A process for preparing an imidazolidine-2,5-dione derivative of the formula



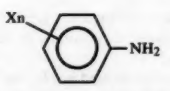
(IV)

which comprises reacting phosgene or trichloromethyl chloroformate with methylhydantoin of the formula



(VI)

in the presence of a dehydrogen chloride agent, and further reacting the resulting product with an aniline derivative of the formula



(VII)

in the presence of a dehydrogen chloride agent, wherein X is

halogen atom, lower alkyl, lower alkoxyl, lower haloalkyl, nitro, cyano or alkoxycarbonyl, n is an integer of 0 or 1 to 4.

5,151,525

PROCESS FOR PRODUCING 2-OXO-1,3-DIBENZYL-4,5-CIS-IMIDAZOLIDINEDICARBOXYLIC ACID

John J. Seiter, Houston, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 18, 1991, Ser. No. 717,146
Int. Cl.[5] C07D *233/32*
U.S. Cl. 548—321 14 Claims

1. In a process wherein:

(a) alkali metal salt of meso-2,3-bis(benzylamino)succinic acid, phosgene, and alkali metal hydroxide are reacted under alkaline conditions and in the presence of water and substantially water-immiscible inert liquid organic solvent in a multi-phase system to form a multi-phase mixture comprising:

(1) an aqueous solution of alkali metal salt of 2-oxo-1,3-dibenzyl-4,5-cis-imidazolidinedicarboxylic acid having a pH of at least about 7.5, and

(2) a liquid organic phase, and

(b) said aqueous solution is acidified to precipitate 2-oxo-1,3-dibenzyl-4,5-cis-imidazolidinedicarboxylic acid and to form an aqueous mother liquor,

the improvement wherein said substantially water-immiscible inert liquid organic solvent is anisole.

5,151,526

4-[1-(1-NAPHTHALENYL)ETHYL]-1H-IMIDAZOLE, METHOD OF MAKING AND USE AS AN ANESTHETIC

Fu-Lian Hsu, Rockville, and William P. Ashman, Bel Air, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 607,405, Oct. 11, 1990, abandoned. This application Aug. 2, 1991, Ser. No. 739,650
Int. Cl.[5] C07D *233/58*
U.S. Cl. 548—335 1 Claim

1. 4-[1-(Naphthalenyl)ethyl]-1H-imidazole.

5,151,527

SYNTHESIS OF THE CARBANION 1,1,2-TRICYANO-2-(3,4-DICYANO-5-IMINO-2,5-DIHYDRO-1H-PYRROL-2-YLIDENE) ETHANIDE

Alberto Flamini, Rignano Flaminio, Italy, and Nicola Poli, Monterotondo, S.C., assignors to Consiglio Nazionale delle Ricerche, Rome, Italy

Filed Dec. 14, 1990, Ser. No. 627,576
Claims priority, application Italy, Dec. 28, 1989, 22867 A89
Int. Cl.[5] C07D *487/04*
U.S. Cl. 548—451 6 Claims

1. A process for preparing the sodium salt of the carbanion 1,1,2-tricyano-2-(3,4-dicyano-5-imino-2,5-dihydro-1H-pyrrol-2-ylidene) ethanide, characterised by reacting disodium-tetracyano-ethylene in an organic solvent, chosen from ethers, esters, aromatics and nitriles, with an excess of a Lewis acid, the solution then being treated with water.

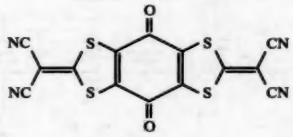
5,151,528

CHARGE TRANSFER COMPLEX FORMED BETWEEN BENZOQUINONE DERIVATIVE AND ELECTRON DONOR AND PROCESS FOR PRODUCING THE SAME

Toshio Mukai, 2-1-2, Tsunogoro, Sendai-shi, Miyagi; Yoshiro Yamashita, and Takanori Suzuki, both of Miyagi, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo and Toshio Mukai, Miyagi, both of, Japan

Division of Ser. No. 131,665, Dec. 11, 1987, Pat. No. 4,960,886. This application Jun. 21, 1990, Ser. No. 541,517
Claims priority, application Japan, Dec. 15, 1986, 61-298371; Dec. 15, 1986, 61-298372; Dec. 15, 1986, 61-298373
Int. Cl.[5] C07D *339/00*
U.S. Cl. 549—31 2 Claims

1. A benzoquinone derivative representative by formula



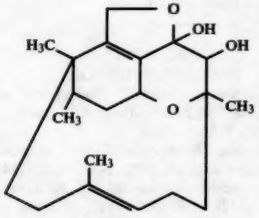
5,151,529

PLATELET ACTIVATING FACTOR ANTAGONISTS, NAMED "THE PHOMACTINS" THEIR PREPARATION AND USE

Aiya Sato; Michihiro Sugano; Kouhei Furuya; Takeshi Oshima; Harumitsu Kuwano; Tadashi Hata, and Hideyuki Haruyama, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 440,235, Nov. 22, 1989, abandoned. This application Oct. 10, 1990, Ser. No. 596,580
Claims priority, application Japan, Nov. 28, 1988, 63-300278
Int. Cl.[5] C07D *313/00, 311/92*
U.S. Cl. 549—354 2 Claims

1. The compound of formula (I):



(I)

5,151,530

TREATMENT OF TERTIARY BUTYL HYDROPEROXIDE DISTILLATION FRACTION TO REMOVE ACIDIC CONTAMINANTS

Edward T. Marquis, Austin; John R. Sanderson, Leander, and Robert A. Meyer, Austin, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

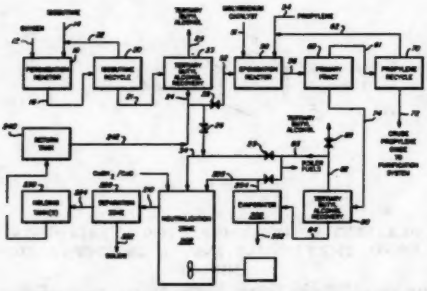
Division of Ser. No. 400,901, Aug. 30, 1989, Pat. No. 5,093,506. This application Sep. 25, 1991, Ser. No. 765,610
Int. Cl.[5] C07D *301/32;* C07C *27/10*
U.S. Cl. 549—529 5 Claims

1. In a method wherein isobutane is reacted with oxygen to provide a reaction product comprising unreacted isobutane, tertiary butyl hydroperoxide, tertiary butyl alcohol and carboxylic acid impurities, including formic acid, acetic acid and isobutyric acid, the improvement for at least partially purifying said reaction product which comprises the steps of:

a. charging said reaction product to a distillation zone and

separating it therein into at least a lighter isobutane fraction and a heavier distillation fraction comprising tertiary butyl hydroperoxide, tertiary butyl alcohol and carboxylic acid impurities, including formic acid, acetic acid and isobutyric acid,

b. charging said heavier distillation fraction to a neutralization zone and treating said heavier distillation fraction therein with about ½ to 1 equivalent of calcium hydroxide or calcium oxide or a mixture of calcium hydroxide with calcium oxide, based on the carboxylic acid content of said heavier distillation fraction to thereby provide a slurry of solid precipitate in said thus-treated heavier distillation fraction,



c. charging said slurry to a separation zone and separating it therein into a solids fraction and a liquid filtrate fraction comprising said partially purified heavier distillation fraction comprising tertiary butyl hydroperoxide, and tertiary butyl alcohol, and

d. recovering said filtrate, whereby, use of said filtrate as a feed component in an epoxidation reaction wherein an olefin is reacted with tertiary butyl hydroperoxide in solution in tertiary butyl alcohol in the presence of a soluble molybdenum catalyst will not cause molybdenum to precipitate from said solution.

5,151,531

DIHYDRIC PHENOLS

Kazuyoshi Shigematsu; Takashi Nakagawa, and Shuji Sakamoto, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

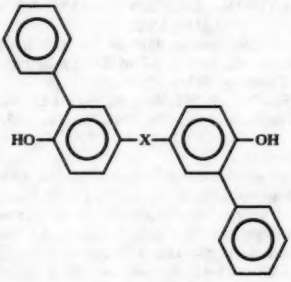
Division of Ser. No. 65,305, Jun. 18, 1987, abandoned. This application Aug. 25, 1988, Ser. No. 236,142

Claims priority, application Japan, Jun. 20, 1986, 61-142842; Jun. 20, 1986, 61-142843; Feb. 20, 1987, 62-37595

Int. Cl.[5] C07C *11/09, 11/10, 43/21*

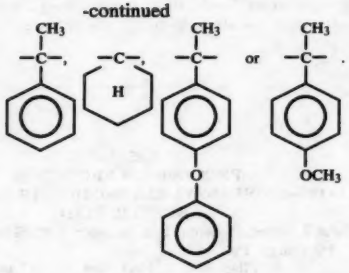
U.S. Cl. 552—115 **5 Claims**

1. A dihydric phenol having the following general formula



-continued

wherein X is



5,151,532

PROCESS FOR THE PRODUCTION OF HIGH-PURITY TETRACHLORO-1,4-BENZOQUINONE

Otto Arndt, Hofheim am Taunus, and Theodor Papenfuhs, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 151,893, Feb. 3, 1988, abandoned. This application Jun. 27, 1991, Ser. No. 724,499

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703567

Int. Cl.[5] C07C *50/24, 46/06*

U.S. Cl. 552—308 **8 Claims**

1. A process for the preparation of high-purity tetrachloro-1,4-benzoquinone by the action of hydrogen peroxide and hydrochloric acid on hydroquinone, which comprises causing 3.8 to 4.2 times the molar quantity of 30% to 37% hydrochloric acid and 1.9 to 2.1 times the molar quantity of 50% to 35% hydrogen peroxide, to act at 5° C. to 50° C. on 1 mole of hydroquinone in at least 12 times the molar quantity of 30% to 37% hydrochloric acid, then heating the resulting suspension, which essentially contains 2,5-dichlorohydroquinone, to 45° C. to 55° C. and again causing to act on the resulting suspension, at 50° C. to 95° C., 3.8 to 4.2 times the molar quantity of 30% to 37% hydrochloric acid and 1.9 to 2.1 times the molar quantity of 50% to 35% hydrogen peroxide, in each case based on the hydroquinone used, and finally adding to the suspension, which is now essentially composed of trichloro-1,4-benzoquinone, 1.9 to 2.1 times the molar quantity of hydrochloric acid of the said concentration range, and 0.95 to 1.05 times that molar quantity of hydrogen peroxide of the said concentration range, in each case based on the hydroquinone used, at 95° C. to 115° C., sufficiently slowly for no chlorine to escape, the process being carried out in the presence or absence or a secondary alkanesulfonate.

5,151,533

PROCESS FOR THE PRODUCTION OF 3-HYDROXY-1,3,5(10)-ESTRATRIEN-17-ONE

Michael Buback, Gottingen; Josef Hader, Berlin; Hans-Peter Voegele, and ZaKarya Al-Massri, both of Göttingen, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Japan

PCT No. PCT/DE90/00690, § 371 Date Jun. 22, 1991, § 102(e) Date Jun. 22, 1991, PCT Pub. No. WO91/04264, PCT Pub. Date Apr. 4, 1991

PCT Filed Sep. 6, 1990, Ser. No. 721,608

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1989, 3931820

Int. Cl.[5] C07J *1/00*

U.S. Cl. 552—625 **6 Claims**

1. A process for the production of 3-hydroxy-1,3,5(10)-estratrien-17-one by pyrolysis of 1,4-androstadiene-3,17-dione in the presence of 1,2,3,4-tetrahydronaphthalene as hydrogen donor, comprising:

preheating 1,2,3,4-tetrahydronaphthalene to a temperature of 450°–480° C.;

mixing the preheated 1,2,3,4-tetrahydronaphthalene in a mixing zone with a solution of 1,4-androstadiene-3,17-dione, in 1,2,3,4-tetrahydronaphthalene, said solution being heated to a temperature of up to 300° C.;

heating the resultant mixture in a pyrolysis zone to a temperature of 450°–700° C., under a pressure of 3.5×10^6–3×10^8 Pa, and a retention time of 0.001 to 60 seconds; and

removing the resultant product from said pyrolysis zone and cooling same.

5,151,534

SULPHUR-CONTAINING EICOSANOIDES AND THEIR APPLICATION IN PHARMACY AND IN COSMETICS

Braham Shroot, Antibes; Christopher Hensby, Biot; Jean Maignan, Tremblay les Gonesse; Gerard Lang, Saint Gratien, and Michel Colin, Livry Gargan, all of France, assignors to Centre International De Recherches Dermatologiques (CIRD), Valbonne, France

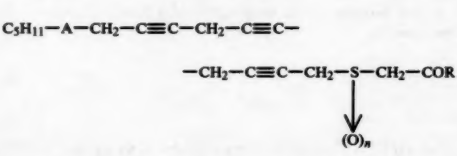
Filed May 10, 1989, Ser. No. 349,691

Claims priority, application France, May 10, 1988, 8806313

Int. Cl.[5] C08H *3/00*

U.S. Cl. 554—88 **12 Claims**

1. A compound having the formula



wherein

A represents $-(CH_2)_2$ or $-(C\equiv C)-$,

n is equal to 0, 1 or 2,

R represents hydroxyl or alkoxy having the formula OR_1 and

R_1 represents alkyl containing 1–20 carbon atoms, monohydroxyalkyl, polyhydroxyalkyl, aryl or aralkyl,

and the salt of said compound and its optical and geometric isomers.

5,151,535

FLUORINE-CONTAINING α,β-BIFUNCTIONAL COMPOUNDS AND PROCESS FOR THEIR PRODUCTION

Takamasa Fuchikami, and Hisao Urata, both of Sagamihara, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

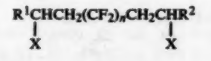
Filed Jan. 31, 1990, Ser. No. 472,864

Claims priority, application Japan, Feb. 16, 1989, 1-35033; Feb. 16, 1989, 1-35034; May 2, 1989, 1-112081

Int. Cl.[5] C07C *53/21*

U.S. Cl. 554—226 **1 Claim**

1. A fluorine-containing α,ω-bifunctional compound having the formula:



wherein each of R^1 and R^2 independently is an alkyl group having 1 to 10 carbon atoms or an aralkyl group having 7 to 10 carbon atoms; X is —COOH, —$COOR^3$ or —COY, wherein R^3 is an alkyl group having 1 to 5 carbon atoms and Y is a halogen atom; and n is an integer of at least 1.

5,151,536

PROCESS FOR THE MANUFACTURE OF PESTICIDAL 1-(ALKOXYMETHYL) PYRROLE COMPOUNDS

Venkataraman Kameswaran, Princeton Junction, and Jerry M. Barton, East Windsor, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 17, 1990, Ser. No. 628,744

Int. Cl.[5] C07D *207/30, 207/12, 207/30, 207/18*

U.S. Cl. 548—530 **10 Claims**

1. A process for the preparation of a compound of formula I

(I)

wherein

R is C_1–C_6 alkyl;

W is CN or NO_2;

X is H, CN, halogen or phenyl optionally substituted with one to three halogens, CN, NO_2, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, CF_3, $R_1CF_2R_2$, R_3CO or NR_4R_5 groups;

Y is CF_3 or halogen;

Z is H, CF_3, halogen or phenyl optionally substituted with one to three halogen, CN, NO_2, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, CF_3, $R_1CF_2R_2$, R_3CO or NR_4R_5 groups;

R_1 is H, F, CHF_2, CHFCl or CF_3;

R_2 is $S(O)_n$ or O;

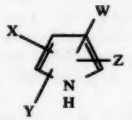
R_3 is C_1–C_3 alkyl, C_1–C_3 alkoxy or NR_4R_5;

R_4 is H or C_1–C_3 alkyl;

R_5 is H, C_1–C_3 alkyl or R_6CO;

R_6 is H or C_1–C_3 alkyl and

n is an integer of 0, 1 or 2 which comprises reacting a compound of formula II



(II)

wherein W, X, Y and Z are described above with at least one molar equivalent of a dihalomethane in the presence of at least two molar equivalents of an alkali metal C_1–C_6alkoxide and optionally about one molar equivalent of an alkali metal hydride and a solvent.

5,151,537

PROCESS FOR THE RECOVERY OF RHODIUM FROM THE RESIDUES OF DISTILLATION PROCESSES

Peter Lappe, Dinslaken, and Helmut Springer, Oberhausen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 7, 1991, Ser. No. 741,643

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1990, 4025074

Int. Cl.[5] B01J *31/40*; C07C *45/50, 47/02*

U.S. Cl. 556—136 **32 Claims**

1. A method for the recovery of rhodium present as homogeneously dissolved compounds from a residue of a reaction catalyzed by said rhodium, said method comprising

treatment of said residue with a first oxygen-containing gas in an initial reaction stage at an initial stage temperature of 60° to 120° C. under an initial stage pressure of at least one atmosphere in the presence of a first monocarboxylic acid

having 2 to 4 carbon atoms and a first alkali metal salt of a second carboxylic acid having 2 to 4 carbon atoms;

a first extraction of said rhodium as a water soluble compound from said residue with water to form an aqueous phase and an organic phase, separating said organic phase from said aqueous phase;

introducing an aldehyde into said organic phase in a second stage before oxidation with a second oxygen-containing gas at a second stage temperature of 60° to 120° C. under a second stage pressure of at least one atmosphere, a third monocarboxylic acid having 2 to 4 carbon atoms, and a second alkali metal salt of a fourth monocarboxylic acid having 2 to 4 carbon atoms; and

a second extraction of said rhodium from said organic phase with a water-containing substance.

5,151,538

ORGANOSILICON COMPOUND AND PROCESS FOR PRODUCING ORGANOSILICON COMPOUND

Teruyuki Hayashi; Toshiaki Kobayashi, and Masato Tanaka, all of Tsukuba, Japan, assignors to Agency of Industrial Science and Technology, Japan

Filed Jan. 12, 1990, Ser. No. 464,124

Claims priority, application Japan, Jan. 13, 1989, 1-7358; Mar. 3, 1989, 1-52654

Int. Cl.[5] C07F 7/08, 7/10

U.S. Cl. 556—431 **5 Claims**

1. A process for preparing an organosilicon compound having a Si—C—C—Si bond, a C=C—Si bond and/or a CH—CH—Si bond, comprising the step of (a) reacting an olefin compound represented by the following general formula (I):

$$R^1R^2C{=}CHR^3 \quad (I)$$

wherein R^1, R^2 and R^3 are each hydrogen atom, an alkyl group, a cycloalkyl group, an aliphatic heterocyclic group, an aralkyl group, an aryl group, an aromatic heterocyclic group, an alkoxycarbonyl group, a cyano group, an N,N-dialkylaminocarbonyl group, an alkoxy group, an N,N-dialkylamino group, an N-alkyl-N-acylamino group or an N,N-diacylamino group, and may link with each other to form a cyclic structure,

with a disilane represented by the following general formula (II):

$$R^4R^5R^6Si{-}SiR^7R^8R^9 \quad (II)$$

wherein R^4, R^5, R^6, R^7, R^8 and R^9 are each an alkyl group, a cycloalkyl group, an aryl group, an aralkyl group, an alkoxy group, an acyloxy group, an N,N-dialkylamino group, fluorine atom, bromine atom or chlorine atom, and may link with each other to form a cyclic structure,

in the presence of a platinum-containing catalyst.

5,151,539

FORMATION OF TETRAARYLPYROPHOSPHATE

Danielle A. Bright, Spring Valley, and Alan M. Aaronson, Flushing Meadows, both of N.Y., assignors to Akzo America Inc., Dobbs Ferry, N.Y.

Continuation of Ser. No. 374,719, Jul. 3, 1989, Pat. No. 5,041,596. This application May 28, 1991, Ser. No. 706,138

Int. Cl.[5] C07F 9/02

U.S. Cl. 558—128 **5 Claims**

1. A process for the formation of a tetraarylpyrophosphate by the hydrolytic condensation of a diarylhalophosphate.

5,151,540

THIO CARBAMATES AND THEIR DERIVATIVES

Mohammad Aslam, and Kenneth G. Davenport, both of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Nov. 26, 1986, Ser. No. 935,461

Int. Cl.[5] C07C 333/00, 211/00

U.S. Cl. 558—232 **6 Claims**

1. As a new composition of matter, O-(6-acetyl-2-naphthyl)-N,N-dimethylthiocarbamate.

5,151,541

PROCESS FOR THE PREPARATION OF DIALKYL CARBONATES

Klaus Joerg, Limburgerhof; Rudolf Kummer, Frankenthal, and Franz-Josef Mueller, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

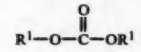
Filed Aug. 6, 1990, Ser. No. 562,708

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1989, 3926710

Int. Cl.[5] C07C 69/96

U.S. Cl. 558—277 **10 Claims**

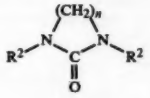
1. In a process for the preparation of a dialkyl carbonate of the formula



(I)

in which R^1 is C_1–C_{10}-alkyl, by reaction of an alcohol R^1OH with a gaseous carbon monoxide/oxygen mixture in the presence of a copper catalyst and a co-solvent at an elevated temperature of about 70° to 150° C. and under pressure of about 1 to 100 bar, the improvement which comprises:

using as the co-solvent at least one cyclic urea of the formula



(II)

in which n is equal to 2, 3 or 4 and R^2 denotes hydrogen or C_1–C_4-alkyl.

5,151,542

PROCESS FOR PREPARING DI-TERT.-BUTYL DICARBONATE

Isao Kurimoto, Toyonaka, and Masayoshi Minai, Moriyama, both of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Jul. 16, 1991, Ser. No. 731,007

Claims priority, application Japan, Jul. 23, 1990, 2-195412; Aug. 27, 1990, 2-226225; Feb. 18, 1991, 3-023491; Feb. 18, 1991, 3-023494

Int. Cl.[5] C07C 69/96

U.S. Cl. 558—277 **12 Claims**

1. A process for preparing di-tert.-butyl dicarbonate which comprises reacting alkali metal tert.-butyl carbonate with methanesulfonyl chloride.

5,151,543

SELECTIVE LOW PRESSURE HYDROGENATION OF A DINITRILE TO AN AMINONITRILE

Stanislaw B. Ziemecki, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 31, 1991, Ser. No. 708,945
Int. Cl.[5] C07C 253/30
U.S. Cl. 558—459 14 Claims

1. A process of selective partial hydrogenation of aliphatic dinitriles to aminonitriles comprising:

(i) reacting in the presence of hydrogen an aliphatic dinitrile containing 4 to 12 carbons in a reactor at temperatures of from about 25° to 150° C., and at a pressure of from about 50 to 2000 psi in the presence of

(a) a solvent, said solvent being present in at least a 2:1 molar excess and comprising (i) liquid ammonia or (ii) alcohol of from one to four carbon atoms and containing an inorganic base which is soluble in said alcohol and selected from the group consisting of alkali metal hydroxides, alkali metal methoxides, alkali metal carbonates, alkali earth metal hydroxides, alkali earth metal methoxides and alkali earth metal carbonates; and

(b) a raney-type catalyst selected from the group consisting of Raney nickel, Raney cobalt, and Raney nickel promoted with metals or metal oxides selected from Group VIB or promoted with the ferrous metals of Group VIII of the Periodic Table; and

(ii) recovering the corresponding aminonitrile as the major product, selectivity to the aminonitrile increasing to about 95% with decreasing conversion of the starting dinitrile to about 65%.

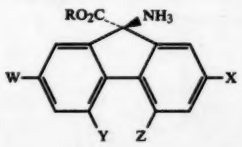
5,151,544

INTERMEDIATES IN THE PREPARATION OF CHIRAL SPIROFLUORENEHYDANTOINS

Mark T. DuPriest; Raymond E. Conrow, and Daniel Kuzmich, all of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed May 25, 1990, Ser. No. 530,766
Int. Cl.[5] C07C 321/00, 229/00
U.S. Cl. 560—10 8 Claims

1. A compound of the formula:



wherein:

R = C_1–C_5 alkyl;

W and X are each, independently of the other, selected from the group consisting of hydrogen, chloro and fluoro;

one of Y and Z is selected from the group consisting of hydrogen, chloro, fluoro, methyl, methoxyl and methylthio and the other is selected from the group consisting of hydrogen, chloro and fluoro;

with the proviso that the W, X, Y and Z are selected such that the resulting compounds are asymmetrical;

or a pharmaceutically acceptable salt thereof.

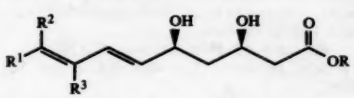
5,151,545

3,5-DIHYDROXY-6,8-NONADIENOIC ACIDS AND DERIVATIVES AS HYPOCHOLESTEROLEMIC AGENTS

Peter A. McCarthy, Pawcatuck, and Frederick J. Walker, Preston, both of Conn., assignors to Pfizer Inc., New York, N.Y.

PCT No. PCT/US87/02623, § 371 Date Mar. 27, 1990, § 102(e) Date Mar. 27, 1990
PCT Filed Oct. 13, 1987, Ser. No. 499,489
Int. Cl.[5] C07C 69/76
U.S. Cl. 560—60 6 Claims

1. A compound having the relative stereochemical formula



(I)

wherein R is hydrogen, (C_1–C_3)alkyl, phenyl or benzyl; and

R^1, R^2 and R^3 are each independently hydrogen, (C_1–C_3)alkyl, benzyl, naphthyl, phenyl or phenyl mono or disubstituted with the same or different substituents selected from the group consisting of F, Cl, Br, I, (C_1–C_3)alkyl, CF_3, (C_1–C_3)alkoxy, benzyl and phenyl, with the proviso that at least one of R^1 and R^2 is other than hydrogen or (C_1–C_3)alkyl;

or

a pharmaceutically acceptable cationic salt thereof when R is hydrogen.

5,151,546

PROCESS FOR THE PRODUCTION OF 4-ACETOXYSTYRENE, ITS POLYMERS AND HYDROLYSIS PRODUCTS

Bakulesh N. Shah, Corpus Christi, Tex.; Dung Q. Tran, North Kingstown, R.I., and Donna L. Keene, Carrollton, Va., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 425,399, Oct. 17, 1989, abandoned, which is a continuation of Ser. No. 221,146, Jul. 19, 1988, abandoned, and a continuation-in-part of Ser. No. 221,145, Jul. 19, 1988, abandoned. This application Oct. 15, 1990, Ser. No. 598,510
Int. Cl.[5] C07C 67/297
U.S. Cl. 560—130 5 Claims

1. In a method for producing 4-acetoxystyrene which comprises heating 4-acetoxyphenylmethylcarbinol, in the presence of a catalytic amount of an acid catalyst, at a temperature of from about 85° C. to 300° C. under a pressure of from about 0.1 mm HgA to about 760 mm HgA at about 0.2 minutes to about 10 minutes, the improvement which comprises contacting the 4-acetoxyphenylmethylcarbinol as a thin film at temperature and pressure limiting residence time at temperature to from about 0.2 minutes to about 2 minutes.

5,151,547

PROCESS FOR PRODUCING ORGANIC CARBOXYLIC ACID ESTERS

Hiroshi Sato, and Hiroshi Yoshioka, both of Ehime, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Mar. 4, 1991, Ser. No. 664,198
Claims priority, application Japan, Mar. 5, 1990, 2-54765; Oct. 11, 1990, 2-274982
Int. Cl.[5] C07C 69/52
U.S. Cl. 560—205 10 Claims

1. A process for producing an organic carboxylic acid ester from an organic carboxylic acid selected from the group consisting of formic acid, acetic acid, propionic acid, butyric acid, acrylic acid, methacrylic acid and crotonic acid corresponding to said organic carboxylic acid ester and an alcohol selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, sec-butanol, iso-butanol, tert-butanol and 2-ethyl-hexanol by esterification reaction in gas phase

which comprises carrying out the reaction with continuously or intermittently feeding sulfuric acid as a catalyst component in the presence of a catalyst carrier.

5,151,548

BENZYL ALCOHOLS AND THEIR LOWER ALKANECARBOXYLIC ACID ESTERS

Dieter Hermeling, Neustadt; Dieter Degner, Dannstadt-Schauernheim; Albrecht Harreus, Ludwigshafen; Norbert Goetz, Worms; Jochen Wild, Deidesheim; Hans Theobald, Limburgerhof, and Bernd Wolf, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

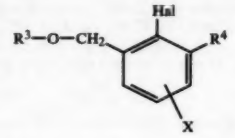
Filed Jun. 12, 1989, Ser. No. 365,129

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1988, 3820897

Int. Cl.[5] C07C *33/50, 69/07, 69/157, 69/24*

U.S. Cl. 560—255 **1 Claim**

1. A benzene derivative of the formula



V

where Hal is fluorine, chlorine or bromine, R^4 is a cyclic alkyl radical of 3 to 12 carbon atoms, R^3 is hydrogen or an R^2—CO—radical, R^2 is hydrogen or alkyl of 1 to 6 carbon atoms and X is hydrogen or halogen.

5,151,549

NAPHTHALENE COMPOUNDS

Takeshi Koyama, Kanagawaa, and Takefumi Abe, Niigata, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

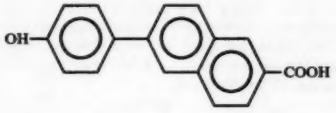
Division of Ser. No. 478,869, Feb. 12, 1990. This application Mar. 5, 1992, Ser. No. 817,043

Claims priority, application Japan, Feb. 28, 1989, 1-45430; Feb. 28, 1989, 1-45431

Int. Cl.[5] C07C *63/34*

U.S. Cl. 562—467 **1 Claim**

1. A compound represented by the formula:



(I)

5,151,550

CYCLOPENTANE DERIVATIVES

Paul H. Briner, Canterbury, England, assignor to Shell Research Limited, United Kingdom

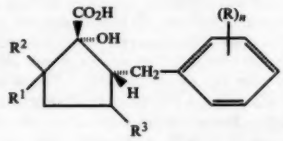
Filed Aug. 19, 1991, Ser. No. 746,874

Claims priority, application United Kingdom, Sep. 3, 1990, 9019191

Int. Cl.[5] C07C *62/04*

U.S. Cl. 562—468 **5 Claims**

1. A compound defined by the formula:



in which n represents an integer from 0 to 5;

each R represents a halogen atom, nitro, hydroxyl, alkyl, haloalkyl, alkoxy, haloalkoxy, amino, alkylamino, dialkylamino, carboxyl, alkanoyl, alkylthio, alkylamido, cycloalkyl or phenyl;

and R^1, R^2 and R^3 independently represent a hydrogen atom or an alkyl group.

5,151,551

METHOD FOR PURIFICATION OF IBUPROFEN COMPRISING MIXTURES

Edward G. Zey; Thomas H. Shockley; Debra A. Ryan, all of Corpus Christi, Tex., and Gary L. Moss, Greer, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Sep. 6, 1990, Ser. No. 579,427

Int. Cl.[5] C07C *51/42*

U.S. Cl. 562—494 **21 Claims**

1. A method of purifying an ibuprofen-comprising first mixture, which mixture comprises at least one complex, said complex comprising at least one ibuprofen molecule, said method comprising the steps of:

(a) treating an ibuprofen-comprisign first mixture by heating said mixture, washing said mixture with a liquid comprising water, azeotroping uncomplexed acid from said mixture, or a combination thereof, thereby destabilizing or breaking up at least one complex comprising at least on ibuprofen molecule; and

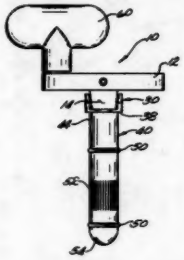
(b) subsequently crystallizing ibuprofen at least once from a second solution or mixture comprising said first ibuprofen-comprisign mixture.

5,151,552

TUBULAR CHOKE WRENCH APPARATUS

Louis A. Alessandri, Jr., 24 French St., Rehoboth, Mass. 02769

Filed Jan. 10, 1992, Ser. No. 818,861
Int. Cl.[5] F41A *35/00*; F41C *27/00*
U.S. Cl. 42—90 12 Claims



9. Choke wrench apparatus for installing and removing tubular chokes in and from respectively gun bores comprising:

a generally cylindrical hub, an integrally formed threaded shank extending along the longitudinal axis of the hub, a slot formed in the shank parallel to and passing through the longitudinal axis, the slot defining first and second legs spaced apart by a blade member seat,

a blade member comprising a central body portion forming a seating surface, a generally parallelepiped blade extending from the central body portion, the blade member received in the slot with the seating surface received on the seat,

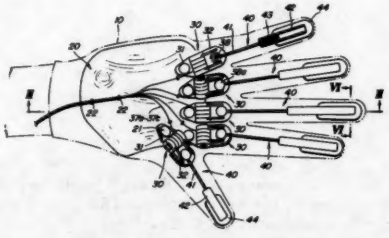
a generally cylindrical guide member having a threaded aperture in a distal end face adapted to receive the threaded shank, the distal end face of the guide member adapted to engage the blade and lock the blade member in its seat, the blade extending radially beyond the hub and guide member and adapted to fit within the slots of a tubular choke.

5,151,553

MUSICAL TONE CONTROL APPARATUS EMPLOYING PALMAR MEMBER

Hideo Suzuki; Shunichi Matsushima; Takamichi Masubuchi; Masahiko Obata, and Masao Sakama, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Nov. 15, 1989, Ser. No. 437,850
Claims priority, application Japan, Nov. 16, 1988, 63-149521[U]; Nov. 16, 1988, 63-289868; Nov. 16, 1988, 63-289869; Nov. 16, 1988, 63-289870
Int. Cl.[5] G10H *7/00, 1/18*
U.S. Cl. 84—600 16 Claims



1. A musical-tone-control apparatus comprising:

a palmar member worn on the palm of a performer;

one or more digit members, each of which is rotatably connected to the upper edge of said palmar member, an worn along the finger of th performer; and

one or more measuring means for measuring the angle of flexion of corresponding digit members relative to said palmar member and producing a musical-tone-control signal based on the measurement,

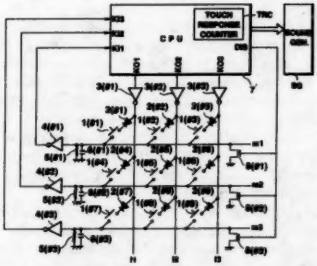
wherein each of said digit members is separated into two segments which are interconnected so as to contract or expand the digit member in the longitudinal direction of said digit member in response to the bending or straightening of the finger.

5,151,554

HIGH SPEED SWITCH SCANNING APPARATUS

Takashi Matsuda, Ome, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1990, Ser. No. 510,966
Claims priority, application Japan, Apr. 27, 1989, 1-105825
Int. Cl.[5] G10H *1/00*; G08C *9/00*
U.S. Cl. 84—655 17 Claims



9. An electronic musical instrument, comprising:

a keyboard having a plurality of keys;

a plurality of switch means associated with said keys and arranged in a switch matrix at intersections of a switch matrix arranged by a plurality of input signal lines and a plurality of output signal lines, each for selectively connecting a corresponding output signal line to a corresponding input signal line electronically;

scanning means for cyclically scanning the switch matrix (i) by supplying voltage pulses to the plurality of output signal lines such that one voltage pulse from said voltage pulses is supplied to each of the plurality of output signal lines once in each of a plurality of cycles, with each of said cycles including a series of said voltage pulses, and (ii) by detecting voltage levels derived from the plurality of input sigral lines in order to detect, in each of said cycles, the respective ON/OFF status of the plurality of switch means;

discharging means for rapidly discharging, in each of said cycles, the plurality of input signal lines at predetermined times between each set of adjacent voltage pulses of said series of voltage pulses from said scanning means; and

sound generating means coupled to said scanning means for generating a musical sound signal having a pitch designated by a switch means, an ON-operation of which is detected by said scanning means.

5,151,555

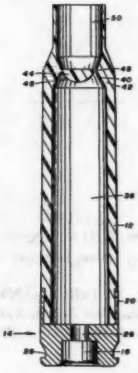
COMPOSITE CARTRIDGE FOR HIGH VELOCITY RIFLES AND THE LIKE

Marlo K. Vatsvog, 10708 Country Club La. S., Seattle, Wash. 98168

Division of Ser. No. 494,918, Mar. 12, 1990, Pat. No. 5,033,386. This application May 28, 1991, Ser. No. 706,310

Int. Cl.[5] F42B *3/00, 5/02, 33/00*

U.S. Cl. 86—10 **15 Claims**



1. A method of manufacturing a rifle cartridge comprising the steps of:

molding a substantially cylindrical plastic cartridge having a bullet receiving end forming a bullet recess; an open, head receiving end with a circumferential head interlock surface thereon; a casing axially disposed between said ends with a thickened shoulder formed therein,; and a pressure regulating front partition extending across the casing separating the bullet recess from a powder chamber at said thickened shoulder, said partition having a frangible annular zone designed to be severed cleanly completely around the periphery thereof;

forming a cartridge head having a coaxial primer recess and a coaxial casing receiving recess, said casing receiving recess comprising a deformable skirt adapted to be swaged into contact about said circumferential head interlock surface;

placing a charge of gunpowder in said casing;

placing a primer in said primer recess;

assembling said casing and said head; and,

swaging said deformable skirt about said head interlock surface to firmly interconnect said casing and said head.

5,151,556

PROPELLANT MAGAZINE FOR FIELD ARTILLERY PIECE

David L. Maher, Hero; Callista M. Rodriquez, Milton, and Paul A. Trahan, St. Albans, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Dec. 24, 1990, Ser. No. 633,702

Int. Cl.[5] F42B *39/08*

U.S. Cl. 89—35.01 **9 Claims**

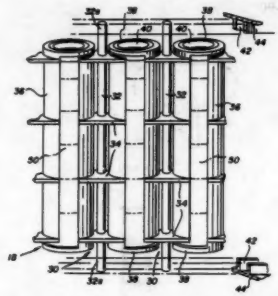
1. A chain conveyor for articles comprising a series of modular conveyor elements, each said conveyor element comprising:

A. an elongated member;

B. a pair of first hoops affixed to said member adjacent one end thereof;

C. a pair of second hoops affixed to said member adjacent the other end thereof, said second hoops having an outer diameter slightly less than the inner diameter of said first hoops;

D. said conveyor elements being arranged in alternating end-for-end orientations with said second hoops nested in said first hoops at each end of each adjacent pair of said



conveyor elements, whereby to pivotally interconnect said conveyor elements.

5,151,557

ADDITIVE FOR PROPELLING CHARGE

Arthur J. Bracuti, Randolph, and Louis A. Bottei, Hacketts-town, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 1, 1991, Ser. No. 724,252

Int. Cl.[5] F42B *5/02*

U.S. Cl. 102—435 **3 Claims**

1. In an improved munition for a gun comprising a propellant charge and a composition for reducing muzzle flash and gun-barrel erosion, the improvement consisting of water glass as an admixture with or adjacent grains of said propellant charge.

5,151,558

AMMUNITION POSSESSING A SUPPORTING MEMBER CONSTITUTED FROM A FOAM MATERIAL

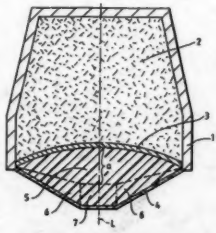
Karl Rudolf, Schrobenhausen, and Gunter Lehrieder, Rothenbach, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Aug. 15, 1991, Ser. No. 746,126

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1990, 4029876

Int. Cl.[5] F42B *12/10*

U.S. Cl. 102—476 **2 Claims**



1. An article of ammunition including a projectile-forming insert; a supporting member consisting of a foam material being arranged intermediate the projectile-forming insert and a structural component, said foam material having at least two regions wherein a first region bordering the projectile-forming insert consists of foam having a maximum density of about 200 kg/m^3 and a second region arranged annularly about a center-

line of said ammunition and adjacent the structural component consisting of foam having a density of greater than 200 kg/m^3.

5,151,559

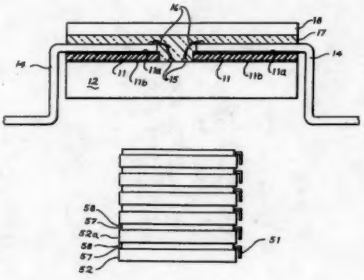
PLANARIZED THIN FILM SURFACE COVERED WIRE BONDED SEMICONDUCTOR PACKAGE

H. Ward Conru, Essex Junction; Gary H. Irish, Jericho; Francis J. Pakulski, Shelburne; William J. Slattery; Stephen G. Starr, both of Essex Junction, and William C. Ward, Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 694,719, May 2, 1991, Pat. No. 5,086,018. This application Dec. 11, 1991, Ser. No. 805,214

Int. Cl.^{5} H01L *23/02;* **H05K** *7/00*

U.S. Cl. 174—52.4 **9 Claims**



1. A semiconductor package comprising:

a semiconductor chip having a first major surface with input and output bonding pads thereon,

a lead frame having a plurality of leads adjacent said first major surface of said chip,

a respective bonding wire connecting a respective one of each of the leads to a respective bonding pad on the chip,

an insulating film secured over the lead frame and the bonding wires, the insulating film comprising a thermosetting plastic adhesive, the thermosetting plastic adhesive being positioned over and between each lead of the lead frame and the wires, with the wires being pressed against the respective pads and the respective leads to which they are connected.

5,151,560

GROUNDING CONNECTOR

Earl R. Kreinberg, Peoria, and Marty E. Adcock, Scottsdale, both of Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 624,858, Dec. 10, 1990. This application Sep. 4, 1991, Ser. No. 754,884

Int. Cl.^{5} H01R *11/00*

U.S. Cl. 174—94 R **29 Claims**

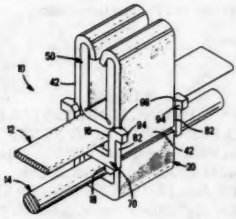
1. An electrical grounding connector for interconnecting lengths of a pair of conductive members, comprising:

an assembly of at least an outer body member including a first base section, and an inner body member including a second base section and being disposed within said outer body member, said first base section defining a first conductor-clamping surface and said second base section opposed therefrom and defining a second conductor-clamping surface, said first and second base sections defining a conductor-receiving region therebetween;

said assembly including corrosion-penetrating means defined along at least two opposed surface portions adjoining said conductor-receiving region and engageable with surfaces of lengths of each of a pair of conductors disposed within said conductor-receiving region, and said assembly defining a conductive path between said corrosion-penetrating means;

said outer body member having a pair of first extensions extending from at least proximate opposed lateral edges of said first base section, and said inner body member having a pair of second extensions extending from opposed lateral edges of said second base section, said first extensions diverging at a selected first angle from first joints at said conductor-receiving region, and said second extensions extending along inside surfaces of said first extensions and diverging at a slightly greater selected angle from second joints with said second base section at said conductor-receiving region;

said first extensions including engagement means proximate free ends thereof firmly engageable during crimping with cooperating engagement means of said second extensions



proximate free ends thereof, said cooperating engagement engagement means closer to said second joints than the distance of said means to said first joints,

whereby when said first extensions are deformed by being rotated toward each other about said first joints, said second extensions therebetween are correspondingly rotated by said first extensions toward each other about said second joints and said cooperating engagement means are engaged by said engagement means and cause said second extensions to urge said second base section of said inner body member toward said first base section pressing said conductor-clamping surfaces against conductors disposed in said conductor-receiving region and urging said corrosion-penetrating means against said conductors and through corrosion on surfaces thereof to establish an electrical interconnection sufficient to define a grounding connection therebetween.

5,151,561

ELECTRICAL CABLE MANUFACTURE

Kenneth R. Emery, Winchester; Harold R. Bennett, Chilbolton, and Jack Clark, Chandlers Ford, all of England, assignors to Pirelli General plc, London, England

Division of Ser. No. 324,387, Mar. 16, 1989, Pat. No. 5,066,516. This application Aug. 6, 1991, Ser. No. 740,989

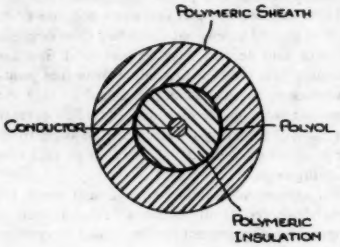
Claims priority, application United Kingdom, Mar. 23, 1988, 8806939; Jan. 31, 1989, 8902074

Int. Cl.^{5} H01B *7/02*

U.S. Cl. 174—120 R **4 Claims**

1. An electrical cable comprising a polymeric sheath extruded over at least one conductor core provided with polymeric insulation when made by a method including applying a

polyol-water mixture over the polymeric insulation of the at least one conductor core prior to extruding the polymeric



sheath thereover such that the polymeric sheath is prevented from adhering to the polymeric insulation.

5,151,562

SYSTEM FOR ADJUSTING HORIZONTAL DEVIATIONS OF AN ELEVATOR CAR DURING VERTICAL TRAVEL

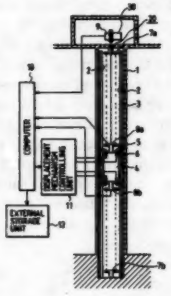
Akira Fujita, and Hisao Kato, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 12, 1991, Ser. No. 714,023

Claims priority, application Japan, Jun. 18, 1990, 2-157474; Jan. 25, 1991, 3-47213

Int. Cl.[5] B66B *3/02*

U.S. Cl. 187—134 **9 Claims**



1. A system for reducing horizontal deviations of elevators in which a cage ascends or descends in an ascending/descending path while engaged with guide rails through guide shoes, said system comprising:

displacement means, disposed between the cage and the guide shoes, for displacing the cage relative to the guide rails in a direction perpendicular to a plane of the guide rails and in a direction parallel to the plane of the guide rails, wherein the parallel and perpendicular displacements are independent of each other;

position detecting means for detecting a position of the cage in the ascending/descending path;

storage means for storing error corresponding to guide rail installation errors with respect to positions of said cage in the ascending/descending direction;

control means for controlling said displacement means to correct positional deviations of the cage at a speed corresponding to an ascending/descending speed of the cage in accordance with error data stored in said storage means, the error data corresponding to the position detected by said position detecting means.

5,151,563

REMOTE CONTROL SWITCH FOR POSTURE ADJUSTMENT OF AUTOMOTIVE MIRRORS

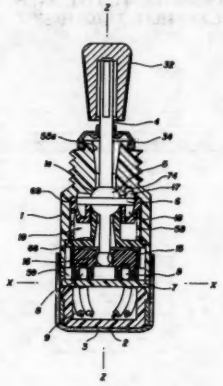
Morimasa Tanaka, Atsugi, Japan, assignor to Ichikoh Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 530,572, May 30, 1990, abandoned. This application Jan. 29, 1992, Ser. No. 826,667

Claims priority, application Japan, May 30, 1989, 1-134560; Jul. 28, 1989, 1-194257

Int. Cl.[5] H01H *9/00, 25/04*

U.S. Cl. 200—6 A **11 Claims**



1. A switch for controlling forward and rearward movement of first and second pairs of DC motors, each of said pairs being used for tilting the mirror surface of one of two mirrors about the horizontal and vertical axes, said switch comprising:

(a) a casing;

(b) a substrate housed in said casing and having a surface;

(c) first and second contact groups disposed on said surface of said substrate and being offset from one another by a predetermined angle, each of said first and second contact groups including sets of contacts controlling one pair of said first and second pairs of DC motors, each of said contact groups including first, second, third and fourth sets of contacts, each of said sets of contacts having four contacts;

(d) a rotary switch member including

first, second, third and fourth electrically conductive ball-like moving contacts, disposed in association with said first, second, third and fourth sets of contacts,

first means for electrically connecting said first and second moving contacts to each other,

second means for electrically connecting said third and fourth moving contacts to each other,

means for holding said moving contacts such that said moving contacts roll on said substrate while retaining their positions relative to each other;

(e) an operating shaft supported on said casing, which is tiltable upward, downward, leftward, and rightward with respect to said casing and which is rotatable along said predetermined angle about an axis of said operating shaft, said operating shaft having a first end connected to said rotary switching member and having a second end disposed remote from said first end;

(f) a knob, provided on said second end of said operating shaft, for providing manual positioning of said operating shaft; and

(g) a posture controller including resilient means for normally biasing said operating shaft into a neutral position in which said axis extends in a direction which is generally perpendicular to said surface of said substrate;

wherein, when said operating shaft lies in said neutral

position, each of said moving contacts assumes a first neutral position between said contacts in a respective one of said sets of contacts of said first group, said moving contacts being movable to a second neutral position such that each of said moving contacts is disposed between said contacts in a respective one of said sets of contacts of said second group; and

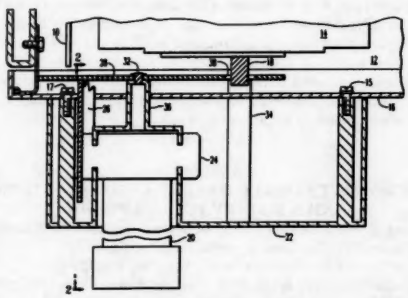
wherein, when said operating shaft is tilted in any of said upward, downward, leftward, or rightward directions, said movable contacts are moved in an opposite direction to that of the tilting direction of said operating shaft causing electrical connection to occur (1) between a respective one of said contacts of said first set of contacts and a respective one of said contacts of said second set of contacts and (2) between a respective one of said contacts of said third set of contacts and a respective one of said contacts of said fourth set of contacts, and, when said operating shaft is moved through said predetermined angle, each of said moving contacts moves from said first neutral position to said second neutral position.

5,151,564

OPERATING MECHANISM FOR A CIRCUIT BREAKER

Neal E. Rowe, Asheville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 11, 1991, Ser. No. 653,608
Int. Cl.[5] H01H *3/00, 15/00*
U.S. Cl. 200—17 R **18 Claims**



1. In a circuit breaker assembly, comprising:

a circuit breaker having switch handle means positioned for movement generally along the intersection of first and second intersecting planes;

toggle handle means associated with said switch handle means and mounted for movement in a third plane which is generally perpendicular to said first and said second planes, and

interconnecting and translating means for interconnecting said switch handle means and said toggle handle means and for translating said movement of said toggle handle means in said third plane into said movement of said switch handle means for several modes of operation for said circuit breaker.

5,151,565

MEDIUM TENSION CIRCUIT BREAKER

Michel Perret, Bourgoin-Jallieu, France, assignor to GEC Alsthom SA, Paris, France

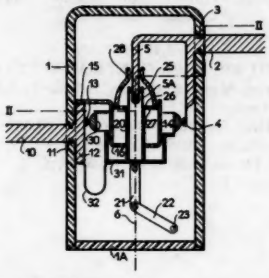
Filed Aug. 7, 1990, Ser. No. 563,636
Claims priority, application France, Aug. 9, 1989, 89 10726
Int. Cl.[5] H01H *33/88*
U.S. Cl. 200—148 A **4 Claims**

1. A medium tension circuit breaker comprising a casing of insulating material enclosing a gas having good dielectric properties and containing the following:

first contacts connected to a first current terminal and second contacts connected to a second current terminal;

a fixed arcing contact electrically connected to said first current terminal and a moving arcing contact in sliding contact with said fixed arcing contact and fixed to a reciprocable connecting rod mechanically connected to a drive member; and

a moving permanent contact fixed to the moving arcing



contact and providing an electrical connection between said first and second contacts when the circuit breaker is in the engaged position;

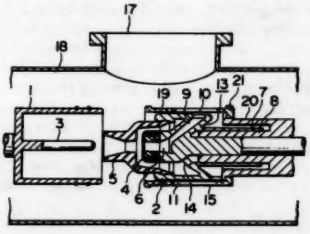
wherein said moving permanent contact is a short tubular part with said first and second contacts being stationary in a common plane and disposed respectively on two diametrically opposed circular arcs, and wherein the angular extent of each of the circular arcs of the first and second contacts is about 120°.

5,151,566

GAS CIRCUIT BREAKER

Osamu Koyanagi; Yasuharu Seki, and Masanori Tsukushi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1990, Ser. No. 635,251
Claims priority, application Japan, Jan. 8, 1990, 2-553
Int. Cl.[5] H01H *33/88*
U.S. Cl. 200—110 A **4 Claims**



1. A gas circuit breaker comprising:

a main fixed element and a main movable element capable of contacting and moving apart from each other;

a fixed contact provided on the side of said main fixed element;

a movable contact provided on the side of said main movable element and capable of contacting and moving away from said fixed contact;

a hollow nozzle provided inside said movable contact;

a cylinder, a puffer cylinder and a fixed piston provided on said main movable element;

an insulation nozzle surrounding said movable contact, said insulating nozzle being capable of compressing a gas in a puffer chamber defined by said puffer cylinder and said

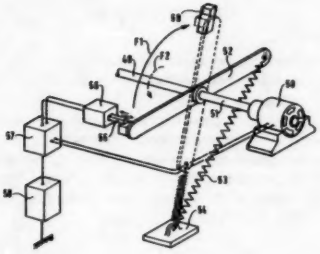
fixed piston and capable of guiding the gas to an opening when said contacts are disconnected;
an opening formed in a side surface of said cylinder to discharge the gas from said hollow nozzle;
a gas flow passage formed to provide a passage between said hollow nozzle and said opening; and
an exhaust guide provided outside said main movable element to close said opening;
wherein said exhaust guide is divided into a plurality of guide members connected by releasable fixing device.

5,151,567

CIRCUIT BREAKER CONTROL APPARATUS

Edmond Thuries, Meyzieu, France, assignor to GEC Alsthom SA, Paris, France

Filed Sep. 10, 1991, Ser. No. 757,373
Claims priority, application France, Sep. 10, 1990, 90 11179
Int. Cl.[5] H01H *33/42, 5/00, 3/00*
U.S. Cl. 200—148 F **1 Claim**



1. Control apparatus for a medium tension or a high tension circuit breaker having a plurality of poles each provided with a drive rod, said control apparatus comprising a DC motor provided with a shaft controlling the motion of the drive rods of said poles, said shaft being fixed to an arm having a first end and a second end, said first end being fixed to a first end of a disengagement spring and said second end being fixed to a fixed point, said arm being capable of taking up a first position in which the spring stores energy and the poles of the circuit breaker are engaged, and a second position in which the spring is relaxed and the poles are disengaged, said second end of the arm being engagable with a retractable abutment capable of taking up a first position in which said abutment holds the arm in said first position and a second position in which said abutment releases the arm, said motor being powered by a power supply, the abutment being retractable by means of an electromagnetic actuator powered by said power supply, and said power supply to the motor and to the actuator being under the control of a programmed electronic circuit to perform a given cycle.

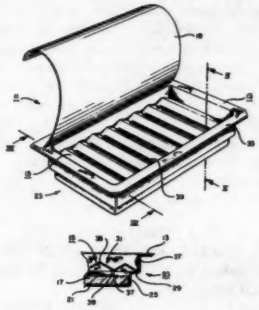
5,151,568

DISPOSABLE MICROWAVE COOKING UTENSIL

Martsey D. Rippley, 1500 N. Park Dr., Unit 140, Fort Worth, Tex. 76102

Filed Nov. 21, 1990, Ser. No. 616,429
Int. Cl.[5] H05B *6/60*
U.S. Cl. 219—10.55 E **8 Claims**

1. A disposable microwave cooking utensil, comprising:
a) container means having a bottom wall and side walls, said side walls being coupled to said bottom wall so as to form a cavity inside of said container means;
b) corrugated wall means located in said cavity of said container means, said corrugated wall means having alternating ridges and hollows, said corrugated wall means having openings therethrough, said openings being located in said hollows, said corrugated wall means being adapted to support food thereon;
c) support means for supporting said corrugated wall means above the bottom wall of said container means such that there is a space between said container wall means and said container means bottom wall, said support means being coupled to said container means;
d) absorbing means for absorbing liquids produced by foods cooking on said corrugated wall means, said absorbing



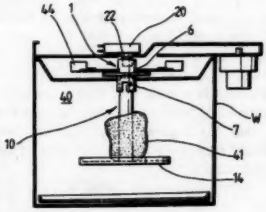
means being located in said space between said corrugated wall means and said bottom wall, said absorbing means being exposed to said openings in said hollows of said corrugated wall means, said absorbing means retaining said liquids within said container means and within said space between said corrugated wall means and said bottom wall;
e) said container means, corrugated wall means, support means and absorbing means being made of materials suitable for use in microwave ovens.

5,151,569

MICROWAVE COOKER HAVING A ROTARY STIRRER AND A ROTARY FOOD SUPPORT

Young S. Suh, Suweon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Filed May 21, 1991, Ser. No. 703,729
Claims priority, application Rep. of Korea, May 29, 1990, 90-7403[U]
Int. Cl.[5] H05B *6/78*
U.S. Cl. 219—10.55 F **13 Claims**



1. A microwave cooker comprising:
a cooking compartment,
a motor having a housing and a rotary output which rotates about a stationary axis,
shaft means driven by said rotary output,
food supporting means for supporting food within said compartment and being mounted on said shaft means to be rotated thereby in spaced relation to said motor, and
a microwave stirrer disposed between said motor and said food supporting means for dispersing microwaves, said

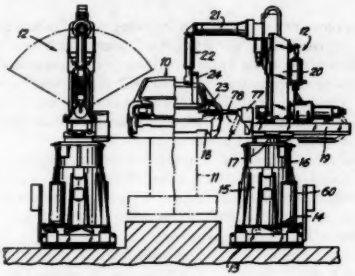
stirrer mounted on said shaft means for being rotated thereby in spaced relation to said motor.

5,151,570

REVOLUTE WELDING ROBOT

Hiromi Sakurai, Nagoya, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1991, Ser. No. 793,813
Claims priority, application Japan, Nov. 22, 1990, 2-315734
Int. Cl.[5] B23K *11/36*
U.S. Cl. 219—86.25 17 Claims



1. A revolute welding robot comprising a base table provided with a first electrode at one end, base table moving means for supporting said base table and for moving said base table between a working position for welding work and a standby position withdrawn from the working position for waiting until feeding of a workpiece, a column with its rear end supported on said base table and its front end extending upward, a slide arm with its rear end supported movable in the longitudinal direction of said column and its front end extending in the same direction as said first electrode, slide arm drive means disposed between said column and said slide arm for driving said slide arm, a swing arm with its rear end rotatably connected to the front end of said slide arm end extending in a direction perpendicular to said slide arm, swing arm drive means disposed between said swing arm and said slide arm for driving said swing arm, an electrode bracket with its rear end rotatably supported at the front end of said swing arm and provided with a second electrode opposing said first electrode provided at the front end extending in the same direction as said swing arm, electrode bracket drive means disposed between said electrode bracket and said slide arm for driving said electrode bracket, and electrode moving means disposed on at least one of said base table and said electrode bracket for driving at least one of said first and second electrodes to the other to a welding position, whereby pressing a plurality of work panels between said electrodes for welding.

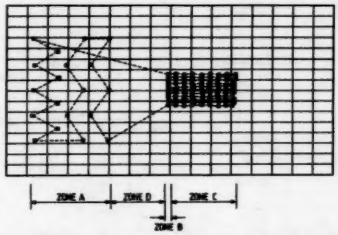
5,151,571

ELECTRON BEAM WELDING

Allan Sanderson, and Colin N. Ribton, both of Cambridge, England, assignors to The Welding Institute, Cambridge, England

Filed Apr. 26, 1991, Ser. No. 692,233
Claims priority, application United Kingdom, May 4, 1990, 9010186
Int. Cl.[5] B23K *15/00*
U.S. Cl. 219—121.13 9 Claims

1. A method of electron beam welding wherein an electron beam is traversed along a weld zone, said electron beam being deflected from a nominal position so as to generate substantially distinct zones of different heat density about said nominal position of said electron beam.

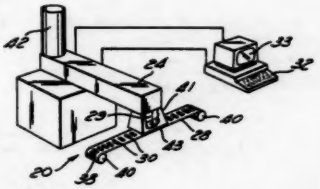


5,151,572

METHOD OF MAKING A STENCIL FOR ETCHING GLASS

David E. Jack, Irvine, Calif., assignor to Prevent-A-Crime International, Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 351,425, May 12, 1989, Pat. No. 4,987,287. This application Oct. 29, 1990, Ser. No. 605,518
The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.69 19 Claims



1. A method comprising:

applying a laser beam to the upper surface of a label, which includes a face stock layer, a layer of releasable adhesive applied to the lower surface of said face stock and a removable liner covering the adhesive; and

producing relative lateral movement between the laser beam and the label to remove the facestock layer and the adhesive layer to create a vehicle identification number in the label layers while not removing the liner, whereby a stencil is created that may be utilized by removing the liner from the adhesive layer and applying the releasable adhesive layer of the facestock to a surface onto which the number is to be marked.

5,151,573

IMAGE FORMING APPARATUS

Shunichi Masuda, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1991, Ser. No. 731,873
Claims priority, application Japan, Jul. 24, 1990, 2-195879
Int. Cl.[5] G03G *15/20*
U.S. Cl. 219—216 9 Claims

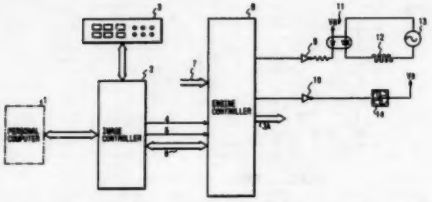
1. An image forming apparatus having thermal fixing means and a cooling fan, comprising:

input means for inputting print data which is sent from an external apparatus;

timer means for starting a timing operation upon completion of an image forming operation; and

control means for controlling the thermal fixing means and the cooling fan on the basis of counted time of the timer

means, wherein said control means turns off the thermal fixing means and the cooling fan when the timer means has



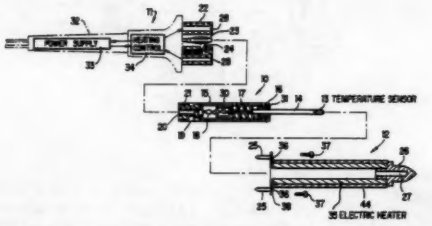
counted a predetermined time without starting a next image forming operation.

5,151,574

ELECTRIC SOLDERING IRON WITH PLUG-IN TIP TEMPERATURE SENSOR

Paul L. Urban, Cheraw, S.C., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Oct. 18, 1989, Ser. No. 423,353
Int. Cl.[5] H05B *1/02*; B23K *3/04*; H01C *7/00*; G01K *7/00*
U.S. Cl. 219—241 **7 Claims**



1. A heated iron comprising an operating element, a body and a detachable sensor unit:

said operating element comprising:

a barrel;

a heating element mounted in association with said barrel; and

a tip located at an end of said barrel in heat exchange relationship with said heating element, said tip having a hollow bore; said body comprising:

a handle connected to the end of said barrel opposite said tip;

means for monitoring the temperature of said operating element in relation to temperature measurements taken by said sensor unit; and

first contacts mounted within said handle for connecting said sensor unit to said monitoring means; and

said detachable sensor unit comprising:

a unit housing;

a temperature sensor mounted within said housing and positioned within said barrel and within said hollow bore of said tip to monitor the temperature of said tip; and

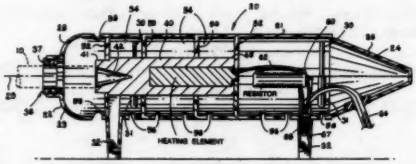
second contacts on said housing for connecting said temperature sensor to said monitoring means, said second contacts being readily detachably connected to said first contacts.

5,151,575

ELECTRICALLY HEATED COLOR CRAYON POINTER

Nathaniel W. Lilly, P.O. Box 67, Stratford, Wash. 98853

Filed Aug. 15, 1990, Ser. No. 568,365
Int. Cl.[5] B29C *33/02*; H05B *3/00*
U.S. Cl. 219—385 **13 Claims**



1. A color crayon pointer for pointing an end of an elongated color crayon having a longitudinal central axis wherein the coloring crayon has a known melting point, comprising:

a housing extending from a rear end to a forward end along a pointing axis with the forward end having an opening aligned with the pointing axis through which the crayon end to be pointed is inserted;

a heat conducting anvil mounted within the housing having a pointing cavity of a desired shape formed therein concentric with the pointing axis adjacent to the forward end for receiving the end of the color crayon when inserted through the housing opening;

a heating element associated with the heat conducting anvil for heating the anvil to a temperature above the melting point of the color crayon to melt the end of the color crayon and conform the end point to the desired shape of the pointing cavity; and

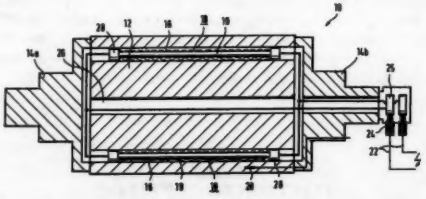
said housing having a crayon guide at the forward end spaced forward of the housing opening and of the heat conducting anvil and aligned with the pointing axis for guiding the color crayon coaxially with the pointing axis so that the conformed end point is coaxial with the longitudinal central axis of the color crayon.

5,151,576

ROLL HAVING HEATING MEANS

Heinz-Michael Zaoralek, Königsbronn, Fed. Rep. of Germany, assignor to Schwabische Huttenwerke GmbH, Aalen-Wasseralfingen, Fed. Rep. of Germany

Filed Aug. 8, 1991, Ser. No. 741,906
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1990, 4024274; Oct. 25, 1990, 4033986
Int. Cl.[5] D06F *67/02*; D21F *5/16*
U.S. Cl. 219—469 **7 Claims**



1. A heatable roll, in particular for processing paper and other web-like material, comprising:

a) a roll body having a plurality of peripheral passages or bores which are formed substantially parallel to the axis of the roll body near the roll surface,

b) at least one removably attached journal pin, and

c) rod or tube-like heating elements arranged in said bores or passages and extending in the axial direction parallel to the roll body, wherein

d) seals are disposed in said bores or passages at the respective ends of the heating elements to form sealed liquid cavities between the heating elements and the walls of the bores or passages, and

e) said sealed cavities are filled to a greater part with a convection liquid.

5,151,577

ELECTRIC SURFACE HEATING AND APPARATUS THEREFOR

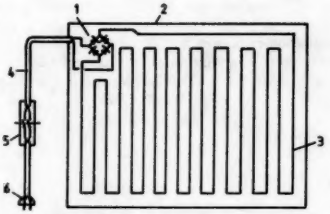
Harold Aspden, Acres High, Hadrian Way, Chilworth, Southampton, SO1 7HZ, England

Filed Jan. 14, 1991, Ser. No. 640,833

Claims priority, application United Kingdom, Feb. 7, 1990, 9002718

Int. Cl.[5] H05B *3/34*

U.S. Cl. 219—528 **4 Claims**



1. Electric single-phase alternating current surface heating apparatus comprising, in combination, two heating elements formed by lengths of wire conductor which are spaced from adjacent wire lengths so as to distribute their heating effect over a surface to be heated, and a single-phase full-wave bridge rectifier circuit component having input connections for the supply of single-phase alternating current and output connections to the heating elements for the supply of unsmoothed full-wave rectified current, whereby ohmic resistance heating of the heating elements is powered primarily by a direct current component, but also by alternating current components at frequencies which are even multiples of the frequency of the single-phase alternating current supplied to the apparatus, said heating elements being connected in parallel so as to be powered from a common single-phase alternating current supply which feeds current for both elements through the common single-phase full-wave rectifier circuit component, the circuits of the two heating element being interconnected to form a bistable system operable to carry current through either of the elements as a function of temperature, the circuit being characterized by there being (a) no reactive components providing current smoothing, whereby the voltage applied across the heating elements is periodically zero-valued and the heating power input fluctuates at twice the power supply frequency, (b) electronically controlled switches in circuit with each of the heating elements, connected to by subject to the control of electric potentials at points of interconnection by cross-connections linking the circuits of the two heating elements, (c) different resistor segments of each of the heating elements comprising materials of different thermal resistance characteristics, whereby the relative electric potentials of the points of interconnection become a function of temperature, the circuit arrangement thereby assuring that both electronically controlled switches are non-conductive at times when the supply voltage is zero-valued and causing the bistable system to be reset at a frequency that is twice the supply frequency but allowing it, when energized, to adopt a state which is a function of temperature.

5,151,578

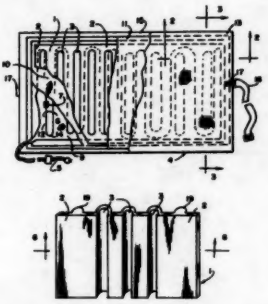
ANISOTROPICALLY BENDABLE HEATING PAD

Jerry G. Phillips, 6800 Cypress Rd. #304, Plantation, Fla. 33317

Filed Aug. 29, 1991, Ser. No. 751,555

Int. Cl.[5] H05B *3/34*; A61F *7/00*

U.S. Cl. 219—549 **18 Claims**



1. A planar heating pad that is substantially rigid in a first direction and substantially flexible in a second direction transverse to the first direction, said heating pad comprising:

a) at least one electrically resistive heating means arranged for heating substantially uniformly a large surface area;

b) electrical connection means for connecting a source of electric power to said heating means;

c) web means for supporting and protecting said heating means, said web means enclosing said heating means, said web means having two broad faces extending substantially in closely spaced parallel planes;

d) a water-tight envelope means for protecting said heating means from exposure to moisture, said envelope means closely enclosing said web means;

e) a flexurally anisotropic stiffening member means for making said heating pad rigid in a first direction and flexible in a second direction transverse to said first direction, both said directions being in a plane parallel to said broad faces of said web means, said stiffening member means being substantially planar and arranged in parallel relationship to said broad faces and extending over said large surface area; and

f) a removable outer covering arranged to enclose said water-tight envelope means and said stiffening member means therein to thereby provide a broad area heating pad having a thickness that is small relative to said area and that bends readily in a second direction for conforming to body contours and that resists bending in a first direction transverse to said second direction, where both directions are in a common plane parallel to said broad faces.

5,151,579

METHOD OF CHECKING CORRELATION BETWEEN PARTS OF A PHOTOFINISHING ORDER THROUGH THE USE OF ERROR WEIGHTS

Maxwell G. Maginness, Redmond, Wash., assignor to Gregtag Systems, Inc., Bothell, Wash.

Filed May 24, 1990, Ser. No. 528,743

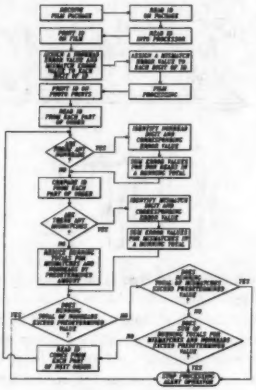
Int. Cl.[5] G06F *15/46*; G06K *7/01*

U.S. Cl. 235—375 **11 Claims**

1. A method of checking correlation between multiple parts of a series of photofinishing orders during processing, comprising the steps of:

(a) assigning a multidigit control number to each order of said series of orders, wherein said multidigit control number changes with each order in the series;

(b) printing said multidigit control number on each part of each order;
(c) reading the multidigit control number from each part of each order;
(d) assigning a nonread error weight to each digit of said multidigit control number according to its position in the multidigit number, with a most frequently changing digit being weighted more than those digits that change with lesser frequency;



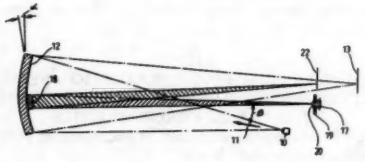
(e) comparing the multidigit control number read from each part of each order in order to match corresponding parts of each order;
(f) while comparing the multidigit control number read from each part of each order, monitoring whether a nonread occurs for each digit of said multidigit control number and summing the error weights corresponding to each nonread in a running total over the series of orders; and
(g) initiating corrective action if the running total of the nonread error weights exceeds a predetermined sum.

5,151,580

LIGHT EMITTING DIODE SCANNER

Boris Metlitsky, Stony Brook; Jerome Swartz, Old Field; Edward Barkan, South Setauket; Howard Shepard, Great Neck; David Goren, Ronkonkoma, and Tony Biuso, South Setauket, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Filed Aug. 3, 1990, Ser. No. 562,130
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—462 **30 Claims**



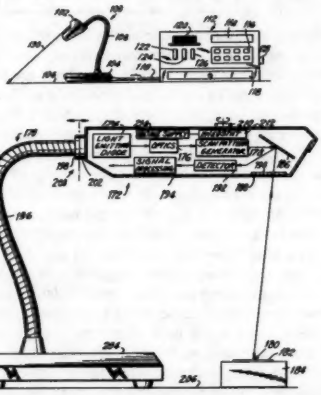
1. A system for reading symbols, comprising:
(a) light source means for generating a light beam;
(b) focusing means for focusing the light beam to a scan spot of predetermined area at a scan plane and for positioning the scan spot on a symbol located in a working distance range in the vicinity of the scan plane;
(c) scanning means for sweeping the scan spot across the symbol in a scan, thereby reflecting off the symbol reflected light, at least a returning portion of which travels away from the symbol back in the direction of said source means, said returning portion of the reflected light having a variable intensity over the scan;
(d) sensor means for viewing and detecting the variable intensity of said returning portion of the reflected light over a field of view, and for generating an electrical signal indicative of the detected variable light intensity;
(e) signal processing means for processing the electrical signal and for generating therefrom data description of the symbol; and
(f) imaging means for imaging a viewing window of the sensor means, said viewing window having an area smaller than that of the scan spot, and for focusing the viewing window at a viewing plane that is spaced away from the scan plane.

5,151,581

POINT-OF-SALE SYSTEM INCLUDING DETACHABLE INFINITELY ADJUSTABLE OPTICAL SCANNER WITH SELECTION OF SCAN PATTERN

Mark Krichever, Hauppauge, and Boris Metlitsky, Stony Brook, both of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Continuation-in-part of Ser. No. 392,207, Aug. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 138,563, Dec. 28, 1987, Pat. No. 4,871,904. This application May 3, 1991, Ser. No. 695,076
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—467 **33 Claims**



1. A point-of-sale system for reading indicia having parts of different light reflectivity, comprising:
(A) a movable electro-optical scanner including
(i) means for propagating and directing a light beam toward indicia located in the vicinity of a work surface exteriorly of the scanner,
(ii) means for detecting at least a portion of light of variable intensity reflected off the indicia over a field of view, and for generating an electrical signal indicative of the detected light intensity,
(iii) means for processing the electrical signal into data descriptive of the indicia being read, and
(iv) means for scanning at least one of said light beam and said field of view in a scan pattern extending over the indicia;
(B) means for adjustably positioning the scanner and the light beam relative to the work surface, and for at least temporarily maintaining the scanner in a selected adjusted orientation during reading; and

(C) user-selected means for selecting the scan pattern to be one of a plurality of predetermined scan patterns operative for reading the indicia.

5,151,582

AUTOMATIC TRANSACTION MACHINE SYSTEM FOR CHECKING CARD DATA AND EMBOSSED CHARACTERS

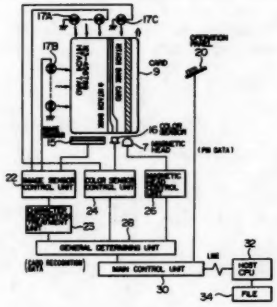
Toshinori Fujioka, Shibata, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,456

Claims priority, application Japan, Dec. 21, 1988, 63-320378

Int. Cl.[5] G06K *7/12, 5/00, 7/00, 7/14*

U.S. Cl. 235—469 **9 Claims**



8. An automatic transaction machine system including a checking means for reading information recorded on a card before starting a transaction, said checking means having means for reading information stored in a magnetic stripe on said card, means for optically reading embossed information formed on a surface of said card, means for optically reading printed information formed on said card, and means for determining whether the information stored in the magnetic stripe is identical to the printed information and the embossed information.

5,151,583

FOCUS ADJUSTMENT DEVICE HAVING RESTRICTING MEANS FOR RESTRICTING A SELECTING ACTION ACCORDING TO THE DEGREE OF NEARNESS OF A DISTANCE MEASUREMENT

Tatsuyuki Tokunaga; Keisuke Aoyama; Hidehiko Fukahori; Yasuo Suda, and Akira Akashi, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 563,787, Aug. 6, 1990, abandoned, which is a continuation of Ser. No. 453,048, Dec. 21, 1989, abandoned, which is a continuation of Ser. No. 350,853, May 12, 1989, abandoned. This application Nov. 25, 1991, Ser. No. 799,029

Claims priority, application Japan, May 16, 1988, 63-118817; May 16, 1988, 63-118818

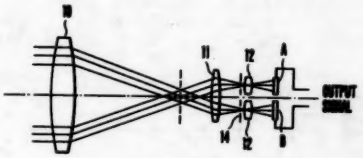
Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.2 **99 Claims**

1. A focus adjustment device for measuring distances from a detector to a plurality of points on an image plane specified by an optical means to obtain distance measurement results, and for adjusting focus of said optical means on the basis of the distance measurement results, comprising:

a) selecting means for selecting information on a distance measurement result indicative of the smallest distance measurement results obtained at said plurality of points; and

b) restricting means for restricting said selecting means from selecting information according to a degree of nearness of said distance measurement result indicative of said nearest point in consideration of a focal length of said optical means, and a position of one of said plurality of points on



said image plane at which said distance measurement result indicative of said nearest point is obtained.

5,151,584

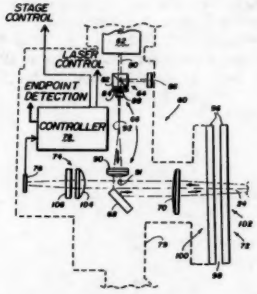
METHOD AND APPARATUS FOR ENDPOINT DETECTION IN A SEMICONDUCTOR WAFER ETCHING SYSTEM

Peter Ebbing, Los Altos, and Manoocher Birang, Santa Clara, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of Ser. No. 652,297, Feb. 5, 1991, Pat. No. 5,007,464, which is a continuation of Ser. No. 446,025, Dec. 5, 1989, abandoned, which is a division of Ser. No. 221,979, Jul. 20, 1988, Pat. No. 4,953,982. This application Oct. 15, 1991, Ser. No. 777,770

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.4 **1 Claim**



1. A method for detecting an etch process endpoint when a layer of material has been etched away from the surface of a substrate, comprising the steps of:

parking a beam of radiant energy on a spot on said layer;

producing an actual etching signal waveform by detecting the amplitude of a signal produced by interference between said beam of radiant energy and a portion of said beam reflected off of said layer;

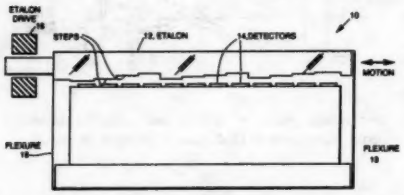
comparing successive values of said actual etching signal waveform over a period of time with a sinusoidal projected etching curve and detecting the endpoint of the etch process when the waveform of the actual etching signal flattens so as to diverge from the projected etching curve.

5,151,585

COHERENT RADIATION DETECTOR

Edward T. Siebert, New Fairfield, Conn., assignor to Hughes Danbury Optical Systems, Inc., Danbury, Conn.

Filed Aug. 12, 1991, Ser. No. 744,204
Int. Cl.[5] G01V *1/20*
U.S. Cl. 250—201.9 32 Claims



1. Apparatus for detecting a presence of continuous wave and/or pulse coherent radiation, comprising:

radiation detector means having a plurality of discrete radiation detector elements disposed upon a surface thereof;

coherence length discriminator (CLD) means having a coherence length longer than a background radiation wavelength and shorter than a wavelength of coherent signals to be detected, said CLD means including means for varying an optical path length therethrough at a plurality of locations, said CLD means being disposed relative to said radiation detector means such that radiation passing through said CLD means is received by said discrete radiation detector elements; and

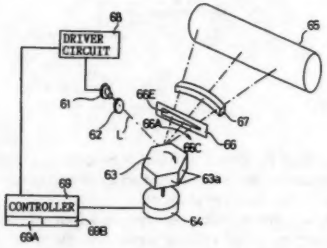
means, coupled to said CLD means, for moving said CLD means relative to said radiation detector means so as to modulate only coherent radiation passing through said CLD means.

5,151,586

SCANNING EXPOSURE DEVICE PROVIDED WITH INTENSITY CORRECTION TO COMPENSATE FOR SCAN ANGLE

Shougo Sato, Nagoya; Tsuyoshi Ohashi, Hashima, and Shinichi Hirahata, Kagamigahara, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 22, 1991, Ser. No. 733,614
Claims priority, application Japan, Aug. 1, 1990, 2-204250; Aug. 27, 1990, 2-224614; Aug. 27, 1990, 2-224615
Int. Cl.[5] G01J *1/26*
U.S. Cl. 250—205 19 Claims



1. A scanning exposure device comprising:

laser means for emitting a laser beam with a predetermined intensity;

a mirror for reflecting the laser beam emitted by said laser means;

a photoconductive means for receiving the laser beam reflected by said mirror;

a scanning exposure means for scanning the laser beam on said photoconductive means in accordance with a variation of an angular position of said mirror to deflect the laser beam, the laser beam impinging said mirror at an angle of incidence that varies with the angular position of said mirror; and

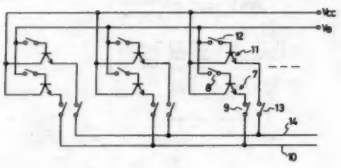
a correcting means for correcting the predetermined intensity of the laser beam so that an intensity of the laser beam on said photoconductive means is invariable regardless of a variation in a reflectance of said mirror due to a variation of the angle of incidence.

5,151,587

IMAGE SENSOR HAVING AN ARRAY OF OPERATIVE AND DUMMY BIPOLAR TRANSISTORS AND PAIRS OF PIXEL SELECTING SWITCHES CONNECTED THERETO

Satoshi Machida; Yukito Kawahara, and Hiroshi Mukainakano, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Jan. 4, 1991, Ser. No. 637,489
Claims priority, application Japan, Jan. 10, 1990, 2-3241
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.1 14 Claims



1. An image sensor comprising:

an array of operative bipolar transistors for effecting photoelectric conversion of incident light;

another array of dummy bipolar transistors optically shielded from incident light and disposed adjacently and correspondingly to the operative bipolar transistors to constitute pairs of the operative and dummy bipolar transistors;

pairs of reset switches connected to the corresponding pairs of the transistors at their base regions to concurrently reset each pair of the operative and dummy bipolar transistors; and

pairs of pixel selecting switches connected to the corresponding pairs of the transistors at their emitters.

5,151,588

RADIATION IMAGING APPARATUS HAVING DETECTION ELEMENTS OF VARYING SIZES

Motosada Kiri, Kyoto, and Susumu Adachi, Osaka, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Continuation of Ser. No. 612,958, Nov. 15, 1990, abandoned.
This application Dec. 13, 1991, Ser. No. 807,632
Claims priority, application Japan, Nov. 24, 1989, 1-305646
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.1 3 Claims

1. A radiation imaging apparatus comprising:

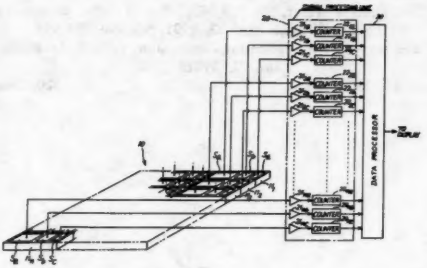
means for exposing an object to be examined to electromagnetic radiation;

a detector array comprising a plurality of radiation detector units each of which corresponds to one of the pixels of a display and comprises a plurality of radiation detecting elements for detecting the radiation from said object under examination, each of said detecting elements having a photosensitive surface of a different area from those of the other detecting elements;

a signal processing circuit of a photon counting type for processing the output signals of said detecting elements to produce an output corresponding to the number of the photons detected by each of said detecting elements; and

a data processor for selecting one or more of said detecting

elements of each of said detector units in accordance with the radiation dose received by said detecting elements so



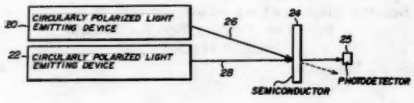
that the output of said selected one or more detecting elements is used as pixel information to form a radiation image of said object on said display.

5,151,589

OPTICAL SYSTEM USING SPIN-DEPENDENT OPTICAL NONLINEARITY

Atsushi Takeuchi, Isehara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 14, 1990, Ser. No. 627,460
Claims priority, application Japan, Dec. 15, 1989, 1-325297
Int. Cl.[5] H01J *31/50*; G02F *1/01*
U.S. Cl. 250—213 A **22 Claims**



1. An optical system comprising:

first light emitting means for emitting a first nonlinearly polarized light beam;

second light emitting means for emitting a second nonlinearly polarized light beam, said second nonlinearly polarized light beam having a pulse waveform;

a semiconductor device receiving said first and second nonlinearly polarized light beams, said semiconductor device having heavy holes and light holes, each of said first and second nonlinearly polarized light beams having a wavelength which excites either heavy holes or light holes so that electrons are generated, said second nonlinearly polarized light beam being projected onto said semiconductor device in a state where said first nonlinearly polarized light beam is being projected onto said semiconductor device; and

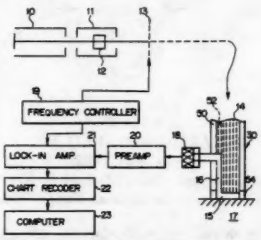
first light receiving means for receiving said first nonlinearly polarized light beam which has an intensity peak caused by said second nonlinearly polarized light beam and which decreases due to a spin relaxation of said electrons.

5,151,590

PHOTOACOUSTIC CELL AND PHOTOACOUSTIC MEASURING DEVICE

Ryuichi Takamoto; Ryujiro Nanba; Masahiro Matsuoka, all of Yokohama, and Tsuguo Sawada, Kodaira, all of Japan, assignors to Shiseido Company, Ltd., Tokyo, Japan

Filed Aug. 20, 1991, Ser. No. 748,320
Claims priority, application Japan, Aug. 20, 1990, 2-218574; Aug. 1, 1991, 3-193164
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—215 **12 Claims**



1. A photoacoustic cell, comprising:

a light guide having a fiber portion consisting of a bundle of a number of optical fibers and a covering portion by which the side surface of said fiber portion is covered, said covering portion of said light guide extending beyond said fiber portion in a manner that when a first end of said light guide is brought into contact with the surface of a material to be measured, a closed space is defined by the end surface of said fiber portion, by the inner wall of said covering portion, and by the surface of said material to be measured;

a pipe having a first end that is open in said closed space and a second end that penetrates through said covering portion and is open toward the outside of said covering portion; and

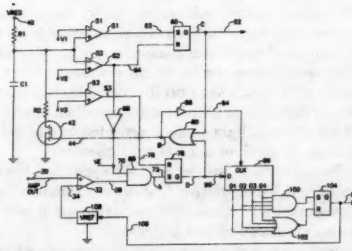
a microphone that is coupled to the second end of said pipe.

5,151,591

ASYNCHRONOUS SIGNAL INTERROGATION CIRCUIT FOR AN DETECTION APPARATUS

Donald D. Johnson, Pearl City, and Jimmy Yee, Rockford, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 20, 1991, Ser. No. 702,566
Int. Cl.[5] H01J *40/14*; H03K *5/19*
U.S. Cl. 250—214 B **14 Claims**



10. A signal interrogation method comprising:

receiving input signal pulses;

defining an acceptable time period having a predefined length, said acceptable time period beginning a predefined time following receipt of a first input signal pulse;

preventing receipt of said input signal pulses except during said acceptable time period;

providing a first record signal in response to receipt of a second input signal pulse coincident with said acceptable time period, said second input signal pulse being subsequent to said first input signal pulse; and

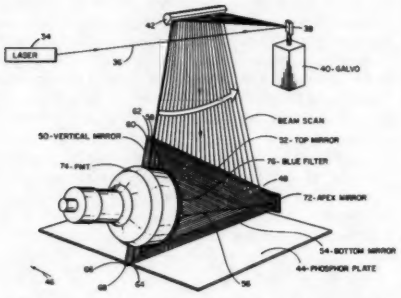
providing a second record signal in response to a lack of receipt of said second input signal pulse coincident with said acceptable time period.

5,151,592

FLARE MINIMIZATION IN SPLIT V-ROOF MIRROR COLLECTOR

John C. Boutet, Rochester, and Michael B. Brandt, Walworth, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 21, 1990, Ser. No. 632,450
Int. Cl.[5] G01J *1/00*
U.S. Cl. 250—228 **10 Claims**



1. A light collector for collecting and detecting light emitted, reflected or transmitted from a scanned information medium comprising:

a vertical mirror extending the width of the scanned medium and having a lower edge adjacent to the scanned medium and an upper edge;

a V-roof mirror located adjacent to said vertical mirror and having upper and lower mirrors forming an apex facing said vertical mirror, said upper mirror having an edge adjacent to and spaced from said upper edge of said vertical mirror and said lower mirror having an edge adjacent to and spaced from the lower edge of said vertical mirror thereby to form aligned slots for the passage of a scanning beam of radiation to an information medium to be scanned and for allowing light emitted, reflected or transmitted by the scanned medium to enter the collector;

wherein said vertical mirror and said upper and lower mirrors of said V-roof mirror form a substantially triangular cross-section which tapers from a large end of said collector to a small end of said collector;

photodetector means having a light receiving face located at the large end of said light collector for receiving light reflected by said light collector and for generating an electrical signal in response thereto; and

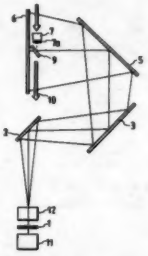
means, associated with said mirrors of said collector, for preventing light of one characteristic to be reflected and for allowing light of a different characteristic to be reflected.

5,151,593

IMAGE READING APPARATUS WITH CORRECTED OPTICAL LENGTH

Yoshitaka Masuda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 529,545, May 29, 1990, abandoned.
This application May 13, 1991, Ser. No. 701,015
Claims priority, application Japan, Jun. 1, 1989, 1-140000
Int. Cl.[5] H01J *3/14*
U.S. Cl. 250—234 **20 Claims**



1. An image reading apparatus, comprising:

illumination means for illuminating an image;

projection means for projecting the image illuminated by said illumination means onto a predetermined surface;

reflection means arranged between said projection means and said predetermined surface; and

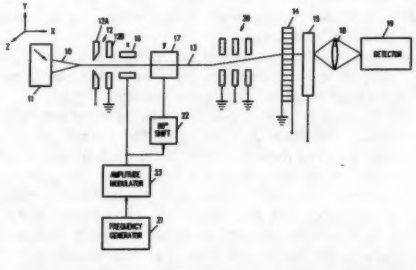
reading means for reading image information of the image projected by said projection means and deflected by said reflection means, an optical path length between said reading means and said reflection means being equal to an optical path length between said reflection means and said predetermined surface, wherein said reflection means and said reading means are arranged adjacent to said predetermined surface.

5,151,594

SUBPICOSECOND ATOMIC AND MOLECULAR MOTION DETECTION AND SIGNAL TRANSMISSION BY FIELD EMISSION

Gary M. McClelland, Palo Alto, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1991, Ser. No. 780,655
Int. Cl.[5] H01J *37/285*
U.S. Cl. 250—306 **22 Claims**



1. A method of generating a time-dependent record depicting the motion of one or more selected atoms with a time resolution equal to or shorter than 10-12 second, comprising the steps of:

applying an electric field to a field emission tip for emitting electrons from the selected atoms;

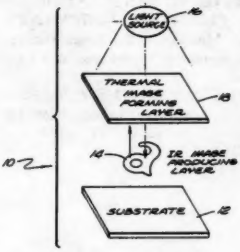
focusing the electrons into a beam; and
sweeping the beam over a spatially resolved electron detector for sensing the intensity of the beam as a function of time for creating the record.

5,151,595

IMAGING DEVICE AND METHOD FOR DEVELOPING, DUPLICATING AND PRINTING GRAPHIC MEDIA

Andrew S. Filo, Cupertino, Calif., assignor to Simon Marketing, Inc., Los Angeles, Calif.

Filed Oct. 16, 1990, Ser. No. 598,266
Int. Cl.[5] G03G *5/00*
U.S. Cl. 250—316.1 **25 Claims**



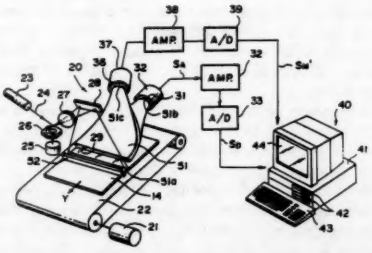
1. An apparatus for developing, printing or duplicating graphic media, comprising:
a cold strobe light source for emitting visible light;
a substrate bearing an infrared image producing layer, said infrared image producing layer being disposed adjacent said light source, said infrared image producing layer having the property of converting visible light into infrared light; and
a thermal image forming layer disposed adjacent said infrared image producing layer, light from said light source causes said infrared image producing layer to convert visible light into infrared light and said infrared light to develop at least one portion of said thermal image forming layer.

5,151,596

METHOD AND APPARATUS FOR DETECTING THE LOCATION OF A PATTERN IN A RADIATION IMAGE STORED ON A STIMULABLE PHOSPHOR SHEET

Shigeru Saotome, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 28, 1991, Ser. No. 676,590
Claims priority, application Japan, Mar. 28, 1990, 2-80020; Mar. 28, 1990, 2-80022; Mar. 28, 1990, 2-80023
Int. Cl.[5] G01N *23/04*
U.S. Cl. 250—327.2 **9 Claims**



1. A radiation image read-out apparatus, comprising:
stimulating ray irradiating means for irradiating stimulating rays to a stimulable phosphor sheets, on which a radiation image has been stored, said stimulating rays causing said stimulable phosphor sheet to emit light in proportion to the amount of energy stored thereon during its exposure to radiation,
first photoelectric conversion means for photoelectrically detecting the emitted light, and thereby generating an image signal representing said radiation image,
second photoelectric conversion means for photoelectrically detecting the stimulating rays, which have been reflected from said stimulable phosphor sheet, and thereby generating a monitor signal, and
detection means for detecting location of a pattern caused to occur in said radiation image, which is represented by said image signal, by dust clinging to said stimulable phosphor sheet, the detection being based on said monitor signal,
wherein said first photoelectric conversion means and said second photoelectric conversion means are combined together such that a single common light input part serves both as a light input part of said first photoelectric conversion means and a light input part of said second photoelectric conversion means.

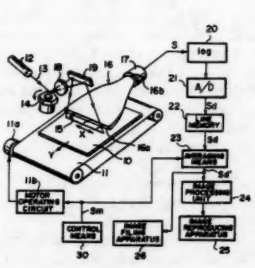
5. A method for displaying a radiation image in which a visible image reproduced from an image signal is displayed, said image signal having been obtained by exposing a stimulable phosphor sheet, on which a radiation image has been stored, to stimulating rays, which cause the stimulable phosphor sheet to emit light in proportion to the amount of energy stored thereon during its exposure to radiation, the emitted light being detected, said method comprising the steps of:
(i) obtaining a specific pattern location signal, which represents the location of a specific pattern appearing in the radiation image represented by said image signal, said specific pattern being caused to occur by a defect, which is present on the surface or in the interior of said stimulable phosphor sheet,
(ii) putting a mark, which indicates said specific patter, on said visible image reproduced from said image signal, and
(iii) displaying said visible image.

5,151,597

METHOD FOR READING OUT RADIATION IMAGES

Toshitaka Agano, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 9, 1991, Ser. No. 682,279
Claims priority, application Japan, Apr. 10, 1990, 2-94649
Int. Cl.[5] G01N *23/04*
U.S. Cl. 250—327.2 **16 Claims**



1. A method for reading out a radiation image, wherein a stimulable phosphor sheet, on which a radiation image has been stored, is scanned with stimulating rays in a main scanning direction and in a sub-scanning direction, the stimulating rays cause the stimulable phosphor sheet to emit light in proportion to the amount of energy stored thereon during its exposure to radiation, the light emitted by a portion of the stimulable phosphor sheet exposed to the stimulating rays is photoelectrically detected, and an image signal representing the radiation image is thereby obtained,

wherein the improvement comprises the steps of:

i) setting a main-scan speed, with which a stimulable phosphor sheet is scanned with said stimulating rays in the main scanning direction, to be the same for a plurality of stimulable phosphor sheets,

ii) setting a sub-scan speed, with which a stimulable phosphor sheet is scanned with said stimulating rays in the sub-scanning direction, to be equal to a value inherent to each of the plurality of stimulable phosphor sheets, and

iii) processing the image signal, which has been detected from each of the plurality of stimulable phosphor sheets, to obtain a processed image signal representing a processed image wherein resolution, with which picture elements in said processed image for each of the plurality of stimulable phosphor sheets are arrayed along the sub-scanning direction, is equal to a predetermined value, even through the speeds with which the plurality of stimulable phosphor sheets are scanned in the sub-scanning direction varies.

5,151,598

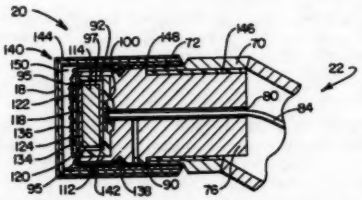
DETECTOR AND LOCALIZER FOR LOW ENERGY RADIATION EMISSIONS

Dennis J. Denen, Columbus, Ohio, assignor to Neoprobe Corporation, Columbus, Ohio

Division of Ser. No. 404,403, Sep. 8, 1989, Pat. No. 5,070,878, which is a continuation-in-part of Ser. No. 271,023, Nov. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 248,920, Sep. 23, 1988, Pat. No. 4,893,013, which is a continuation-in-part of Ser. No. 27,197, Mar. 17, 1987, Pat. No. 4,801,803. This application Dec. 18, 1990, Ser. No. 629,271

Int. Cl.[5] A61B *6/00*

U.S. Cl. 250—336.1 **13 Claims**



1. The method of fabricating an instrument for detecting and locating sources of radiation emission having predetermined energy levels, comprising the steps of:

providing a housing having a forwardly disposed portion;

providing a crystal mount formed of material attenuating radiation of said predetermined energy levels and having a forwardly disposed crystal receiving cavity of predetermined depth having a sidewall extending inwardly thereinto to an electrically insulative surface from a forwardly disposed opening;

locating an electrical biasing contact within said cavity upon said insulative surface;

positioning a first electrically conductive compliant member within said cavity and over and in freely-abutting contact with said biasing contact;

providing a radiation responsive crystal having a rearwardly disposed surface and a side portion extending to a forwardly disposed surface;

positioning said rearwardly disposed surface of said radiation responsive crystal within said cavity upon said first electrically conductive compliant member;

positioning a second electrically conductive compliant member over said crystal forwardly disposed surface;

positioning a flexible grounding contact in freely-abutting contact over said second electrically conductive compliant member;

compressing the assemblage of said electrical biasing contact, said first compliant member, said crystal, said second compliant member, and said grounding contact by stretching a resilient retainer thereover;

mounting said compressed assemblage with said crystal mount upon said housing forwardly disposed portion; and

locating a radiation transmissive cap having a forwardly disposed radiation acceptance window over said compressed assemblage and crystal mount in a manner deriving a dead air space between said window and the forwardmost portion of said compressed assemblage.

5,151,599

DEVICE TO DISPLAY DISINTEGRATIONS OF POSITRONS USING BARYCENTRIC AND TIME OF FLIGHT MEASUREMENTS

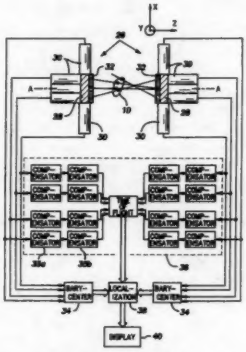
Olivier Monnet, Moirans, and Jacques Vacher, Seyssinet, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 5, 1991, Ser. No. 665,551

Claims priority, application France, Mar. 12, 1990, 90 03101

Int. Cl.[5] G01T *1/164*

U.S. Cl. 250—363.03 **13 Claims**



1. Device to display positron disintegrations, each disintegration being a source of simultaneous emissions of gamma radiations, said device comprising:

at least one pair of scintillators sensitive to gamma radiations and disposed opposite each other, each scintillator having a plurality of faces,

sets of photoelectron multipliers each associated with one scintillator,

for each scintillator, an electronic barycentric measuring device connected to the associated photoelectron multiplier set for measuring the position of the scintillations appearing in the scintillator in question,

for each pair of scintillators, electronic means connected to the associated sets of photoelectron multipliers for determining the times of flight of gamma radiations coincidence—detected in each of the scintillators of the pair in question,

an electronic device for localizing the disintegrations of positrons, said localizing device being connected to the electronic barycentric measuring devices and to the means for determining the times of flight and providing a three-dimensional location for the disintegrations, two dimensions being established by the electronic barycentric measuring devices and the third by the means for determining times for flight,

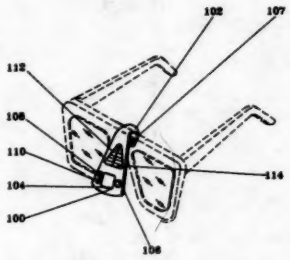
a display system connected to the localization device for displaying a visual indication in response to said three-dimensional locations.

5,151,600

NOSESHADE FOR MONITORING EXPOSURE TO ULTRAVIOLET RADIATION

Michael Black, Foster City, Calif., assignor to Reliant Laser Corporation, Foster City, Calif.

Filed Apr. 13, 1992, Ser. No. 867,433
Int. Cl.[5] G02C 11/00
U.S. Cl. 250—372 18 Claims



1. A noseshade for monitoring a subject's exposure to UV radiation, comprising:

a contoured portion, having clip-on means for attaching said contoured portion to a pair of glasses; and

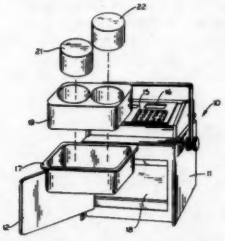
a UV dosimeter incorporated into said contoured portion.

5,151,601

NUCLEAR GAUGE WITH COMPENSATION FOR SAMPLE OF INSUFFICIENT NEUTRON MODERATING ACTIVITY

Ali Regimand, Raleigh, N.C., assignor to Troxler Electronic Laboratories, Inc., Research Triangle Park, N.C.

Filed Feb. 15, 1991, Ser. No. 656,959
Int. Cl.[5] G01N 23/09
U.S. Cl. 250—390.04 14 Claims



1. An apparatus for determining the hydrogen content of a hydrogen-containing material wherein the apparatus subjects a sample of the hydrogen-containing material to neutron radiation from a fast neutron source contained in the apparatus and then detects neutrons that become thermalized by interacting with hydrogen nuclei present in the hydrogen-containing material, the apparatus comprising, in combination:

a gauge housing adapted for receiving a sample therein so that the hydrogen-content thereof can be measured,

a neutron source provided in the housing for subjecting the sample to neutrons,

detector means provided in the housing for detecting thermalized neutrons,

means cooperating with said detector means for calculating from the thus detected thermalized neutrons the hydrogen content of the hydrogen-containing sample, and

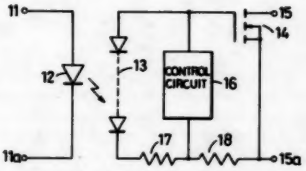
a sample holder adapted to be positioned within said gauge housing, said sample holder being formed of a hydrogen-containing substance and having at least one receptacle formed therein of a size and shape adapted for closely receiving the hydrogen-containing sample and surrounding said sample with said hydrogen-containing substance, said sample holder thus increasing the interaction of neutrons from said source with hydrogen nuclei present in the sample.

5,151,602

SEMICONDUCTOR RELAY CIRCUIT USING PHOTOVOLTAIC DIODES

Yukio Idaka; Shuichiroh Yamaguchi; Hisakazu Miyajima; Takeshi Matsumoto, and Yasunori Miyamoto, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jan. 31, 1991, Ser. No. 648,862
Claims priority, application Japan, Feb. 15, 1990, 2-34567; Oct. 26, 1990, 2-289463; Oct. 26, 1990, 2-289464
Int. Cl.[5] G02B 27/00; H03K 3/42
U.S. Cl. 250—551 5 Claims



1. A semiconductor relay circuit comprising:

a light-emitting element connected to input terminals of said circuit for generating a light signal upon presence of an input current at said input terminals,

a photovoltaic diode array optically coupled to said light-emitting element for generating a photovoltaic output responsive to said light signal from the light-emitting element,

an output MOS FET connected to said photovoltaic diode array and to output terminals of the circuit to vary from a first impedance state to a second impedance state upon application of said photovoltaic output across gate and source electrodes of said MOS FET,

a control means connected across said gate and source electrodes of said MOS FET to be in a high impedance state upon generation of said photovoltaic output and to be in a low impedance state upon disappearance of said photovoltaic output, and

resistors inserted in series with respect to a path of a charge current flowing from said photovoltaic diode array across the gate and source electrodes of said MOS FET and in a path of a discharge current flowing from a capacity across said gate and source electrodes of said MOS FET,

wherein said resistors comprise a first resistor inserted in said path of said charge current and a second resistor inserted in said path of said discharge current.

5,151,603

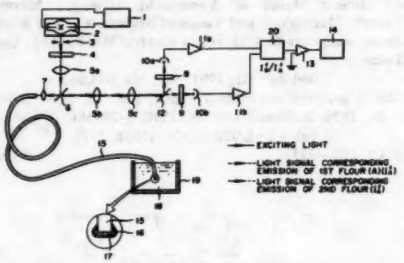
METHOD FOR OPTICAL DETERMINATION OF CONCENTRATION OF SUBSTANCE AND APPARATUS FOR THE DETERMINATION

Hideki Nakamura, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 465,239, Apr. 26, 1990, abandoned. This application Jan. 13, 1992, Ser. No. 820,021
Claims priority, application Japan, Sep. 3, 1987, 62-219021; Sep. 2, 1988, PCT/JP88/00882
Int. Cl.[5] G01N 21/64
U.S. Cl. 250—458.1 10 Claims

1. A method for optical detection of the concentration of a specific substance in a liquid or a gas by utilizing the quenching of a phosphor by said specific substance or a substance derived from said specific substance, which method is characterized by

accomplishing the detection of the concentration of said specific substance by inducing the presence of both a first phosphor (A) selected from the group consisting of tris(2,2'-bipyridine) ruthenium (II) complex, tris(1,10'-phenanthroline) ruthenium (II) complex, 1-pyrenebutyric acid and salts thereof, pyrene, aminopyrene, perylene, perylene dibutylate, and 2,7-dichlorofluorescein, quenched by the specific substance or a substance derived from said specific substance and a second


EXCITING LIGHT
LIGHT SIGNAL CORRESPONDING EMISSION OF 1ST FLOUR (A)(I_A)
LIGHT SIGNAL CORRESPONDING EMISSION OF 2ND FLOUR (I_B)

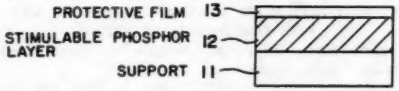
phosphor (B) selected from the group consisting of proflavine sulfate, fluorescein, and eosin Y not substantially quenched by said specific substance or a substance derived from said specific substance, determining a light signal corresponding to the intensity (I_A') of the emission from said first phosphor (A) and a light signal corresponding to the intensity (I_B') of emission from said second phosphor (B), and calculating the ratio between said light signals.

5,151,604

RADIATION IMAGE STORAGE PANEL

Katsuhiro Kohda, and Terumi Matsuda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 22, 1991, Ser. No. 688,271
Claims priority, application Japan, Apr. 20, 1990, 2-104470
Int. Cl.[5] B32B *5/16*
U.S. Cl. 250—484.1 **5 Claims**



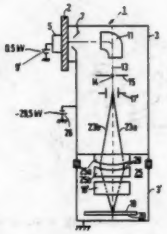
1. A radiation image storage panel with improved sensitivity, sharpness and antistatic properties comprising a support made of a plastic film or a paper material, each containing a white pigment, and a stimulable phosphor layer on said support, wherein an electro-conductive zinc oxide whisker with an average diameter in the range of 0.3 to 3.0 μm and an average length in the range of 3 to 150 μm is contained in at least a portion of said radiation image storage panel.

5,151,605

METHOD OF IRRADIATING AN OBJECT BY MEANS OF A CHARGED PARTICLE BEAM, AND DEVICE FOR PERFORMING THE METHOD

Jarig Politiek, and Henricus J. Ligthart, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1991, Ser. No. 679,976
Claims priority, application Netherlands, Apr. 9, 1990, 9000822
Int. Cl.[5] H01J *37/317*
U.S. Cl. 250—492.2 **18 Claims**



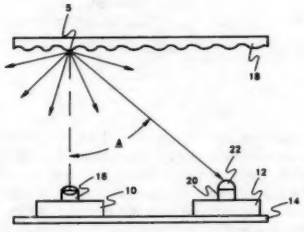
1. A method of irradiating an object with a charged particle beam comprising the steps of
   (a) emitting a charged particle beam from a source,
   (b) periodically deflecting said charged particle beam in a first scanning direction transverse to an optical axis,
   (c) decelerating and focusing the deflected charged particle beam, and thereafter
   (d) periodically deflecting the decelerated charged particle beam onto the object in a second scanning direction transverse to said first scanning direction.

5,151,606

LAMBERTIAN MIRROR OPTICAL

Philip G. Grieve, New York, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 23, 1991, Ser. No. 644,930
Int. Cl.[5] H04B *9/00*
U.S. Cl. 250—551 **15 Claims**



1. A method of facilitating communication among a plurality of components disposed in a substantially planar configuration, comprising the steps of:
   a. associating each of first set of components with means for transmitting optical radiation representative of receiver-specific output information of the associated component;
   b. associating each of a second set of components with means for detecting the optical radiation;
   c. selectively operating the transmission means to irradiate, in a manner representative of the output information, a substantially directionally-invariant reflective surface to produce a reflection that impinges on each detection means; and

d. operating each of the detection means to selectively accept the information.

5,151,607

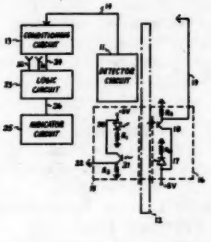
CURRENCY VERIFICATION DEVICE INCLUDING FERROUS OXIDE DETECTION

Timothy T. Crane, Box 78, Dalton, Mass. 01226; Richard A. Menelly, 87 Belden Rd., Burlington, Conn. 06013, and Robert J. Danek, Hendee Rd., R.F.D. #1, Andover, Conn. 06232

Filed May 2, 1991, Ser. No. 694,912

Int. Cl.[5] G06K *5/00*

U.S. Cl. 250—556 **13 Claims**



1. Apparatus for determining authenticity of currency containing a security thread comprising:

a magnetic card reader having a slot for receiving a magnetically-coded card; and

means receiving currency adjacent said card reader, said currency receiving means including circuitry detecting a security thread within said currency and indicating authenticity of said currency.

5,151,608

OPTICAL DISTANCE SENSOR USING A LASER BEAM AND PROCESSING MEANS

Nobutoshi Torii, Hachioji, and Hiroshi Wakio, Oshino, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

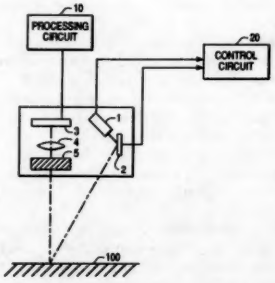
PCT No. PCT/JP90/00505, § 371 Date Dec. 11, 1990, § 102(e) Date Dec. 11, 1990, PCT Pub. No. WO90/13001, PCT Pub. Date Jan. 11, 1990

PCT Filed Apr. 18, 1990, Ser. No. 613,751

Claims priority, application Japan, Apr. 19, 1989, 1-97383

Int. Cl.[5] G01N *21/86*; G01C *3/00*

U.S. Cl. 250—561 **9 Claims**



1. An optical distance sensor having a light emitting section for projecting light toward a subject, and a light receiving section for receiving light reflected from the subject, and arranged to measure a distance from the subject in accordance with a light receiving position on the light receiving section, said optical distance sensor comprising:

said light receiving section having a group of light receiving elements each of which is arranged to generate an output corresponding to an incident light quantity;

scanning means for periodically scanning said light receiving section to successively send said outputs from said group of light receiving elements;

peak detection means for detecting a peak of the outputs from said group of light receiving elements;

processing means, said processing means comprising:

a CCD drive circuit, operatively connected to said light receiving section, controlling the output operation of said light receiving section by generating a scanning start signal at intervals having a first predetermined period and by generating a sample/hold signal at intervals having a second predetermined period shorter than the first predetermined period;

comparator means for comparing an output from one of said light receiving elements with a reference value generated within said comparator means;

first and second memory buffers each having address regions, the number of said address regions being equal to or greater than the number of said light receiving elements;

an address counter circuit, operatively connected to said CCD drive circuit, said light receiving section and said first and second memory buffers, for specifying an arbitrary one of said address regions of each of said memory buffers; and

a flip-flop circuit, operatively connected to said first and second memory buffers and said CCD drive circuit, for controlling write/read operations of said first and second memory buffers.

5,151,609

METHOD OF DETECTING SOLID SHAPE OF OBJECT WITH AUTOFOCUSING AND IMAGE DETECTION AT EACH FOCUS LEVEL

Yasuo Nakagawa, Chigasaki, Japan, and Shree K. Nayer, Pittsburgh, Pa., assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 2, 1990, Ser. No. 561,823

Claims priority, application Japan, Aug. 2, 1989, 1-199223

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—561 **31 Claims**

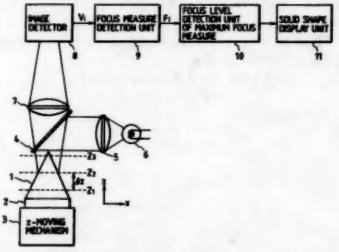


IMAGE DETECTOR
FOCUS MEASURE DETECTION UNIT
FOCUS LEVEL DETECTION UNIT OF MAXIMUM FOCUS MEASURE
SOLID SHAPE DISPLAY UNIT
Z-MOVING MECHANISM

1. A method of detecting a solid shape of an object comprising the steps of:

picking up a plurality of object images with different focus levels with respect to an object whose shape is to be detected;

calculating the focus measure of each of pixels in each of said object images;

comparing the focus measures of the pixels on the same position in said object images with each other, so as to detect the maximum value among these focus measures; and

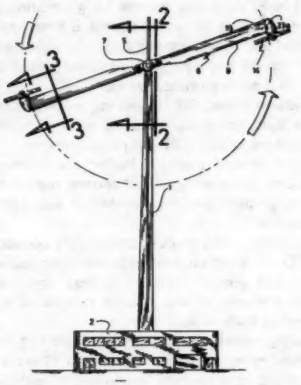
estimating a solid shape of said object based on the focus level of the object image having the maximum value of focus measure.

5,151,610

WIND MACHINE WITH ELECTRIC GENERATORS AND SECONDARY ROTORS LOCATED ON ROTATING VERTICAL BLADES

Jean St-Germain, 1364 rang St-Georges, St-Simon de Bagot, Canada J0H 1Y0

Filed Nov. 29, 1990, Ser. No. 619,423
Int. Cl.[5] F03D *9/00*
U.S. Cl. 290—55 **11 Claims**



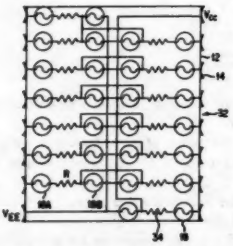
1. A wind machine comprising a wind-driven main rotor rotatable about a main axis and at least two wind-driven secondary rotors carried by said main rotor equally distant from and symmetrically arranged relative to said main axis and each rotatable about a second axis, which is substantially normal to said main axis, each secondary rotor having a smaller diameter than that of said main rotor whereby said main rotor serves to bodily move said secondary rotors through the air at a much greater speed than the wind speed to which said main rotor is exposed, said secondary rotors adapted to transmit torque to a rotary energy-producing device.

5,151,611

PROGRAMMABLE DEVICE FOR INTEGRATED CIRCUITS

Scott R. Rippey, Carney, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 10, 1990, Ser. No. 625,242
Int. Cl.[5] H05K *7/00*
U.S. Cl. 307—202.1 **12 Claims**



1. A programmable device to be electrically connected to an integrated circuit and to be physically located beneath the integrated circuit on an integrated circuit board for providing predetermined logic levels to gates included in the integrated circuit, comprising:

a first and second voltage source;

an insulating body member;

a plurality of pins extending from said insulating body member;

a plurality of resistive members having a first and second end, one resistive member corresponding to each of predetermined ones of said plurality of pins, said second end of said one resistive member connected to said second voltage source; and

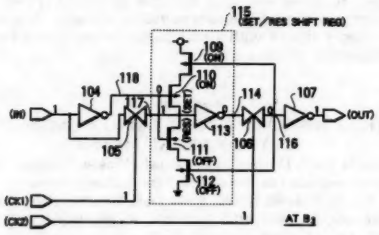
a plurality of programmable fuses, two of said programmable fuses corresponding to each of said predetermined ones of said plurality of pins, wherein a first end of a first one of said two programmable fuses is connected to the corresponding pin, a second end of the first one of said two programmable fuses is connected to said first end of the corresponding resistive member, a first end of a second one of said two programmable fuses is connected to said first voltage source, and a second end of the second one of said two programmable fuses is connected to said first end of said resistive member.

5,151,612

CIRCUIT FOR ELIMINATING DIGITAL NOISE OR SHORT PULSES UTILIZING SET/RESET SHIFT REGISTER

Masahiro Ishikawa, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 23, 1990, Ser. No. 527,442
Claims priority, application Japan, Jun. 22, 1989, 1-158188
Int. Cl.[5] H03K *5/22, 5/00*
U.S. Cl. 307—234 **6 Claims**



1. A digital noise eliminator, comprising:

(a) clock generating means for generating a first clock and a second clock delayed in time with respect to said first clock;

(b) shift means, responsive to an input signal, for selectively transmitting said input signal as an output signal or eliminting said input signal as a noise signal, said shift means comprising

(1) a first transmission gate responsive to said input signal and said first clock, said first transmission gate being turned on in response to said first clock,

(2) a second transmission gate, responsive to said second clock, said second transmission gate being turned on in response to said second clock,

(3) a shift inverter, connected between said first transmission gate and said second transmission gate, for inverting a binary signal level of a signal inputted to said shift inverter;

(c) set means, responsive to said input signal and to said output signal, for setting said shift means when a binary level of said input signal and a binary level of said output signal are both at a first binary signal level; and

(d) reset means, responsive to said input signal and to said output signal, for resetting said shift means when a binary level of said input signal and a binary level of said output signal are both at a second binary signal level;

(e) said clock generating means activating said shift means on the basis of a time delay between said first and second clocks in such a way that said shift means transmits said

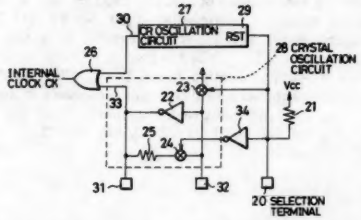
input signal when said input signal has a pulse width wider then a time duration between a down-edge of said first clock and a second-occurrence up-edge of said second clock, eliminates said input signal when said input signal has a pulse width narrower than a time duration between a down-edge of said first clock and a first-occurrence up-edge of said second clock, and transmits or eliminates said input signal when said input signal has a pulse width equal to a time duration extending from a down-edge of said first clock to a time between two next occurring up-edges of said second clock.

5,151,613

LARGE SCALE INTEGRATED CIRCUIT DEVICE FOR SWITCHING OSCILLATION CIRCUIT

Hiroki Satou, and Kazuyuki Horinouchi, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Aug. 7, 1991, Ser. No. 741,264
Claims priority, application Japan, Aug. 22, 1990, 2-88292[U]
Int. Cl.[5] H03K *17/56, 5/13, 3/01;* **H01L** *25/00*
U.S. Cl. 307—243 **19 Claims**



1. An integrated circuit device having a CR oscillation circuit and a crystal oscillation circuit and capable of selecting either the CR oscillation circuit or the crystal oscillation circuit, said integrated circuit device comprising:

means connected to said CR oscillation circuit for receiving an electrical signal;

means connected to both of said CR oscillation circuit and said receiving means for selecting either said CR oscillation circuit or said crystal oscillation circuit in accordance with a state of said electrical signal received by said receiving means; and

means connected to said receiving means for holding said receiving means at a predetermined level of said electrical signal in accordance with a state of said receiving means.

5,151,614

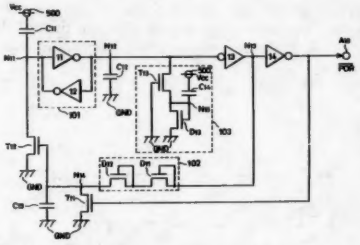
CIRCUIT HAVING CHARGE COMPENSATION AND AN OPERATION METHOD OF THE SAME

Akira Yamazaki; Masaki Kumanoya; Yasuhiro Konishi, and Katsumi Dosaka, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1991, Ser. No. 725,037
Claims priority, application Japan, Jul. 13, 1990, 2-186503
Int. Cl.[5] H03K *17/22*
U.S. Cl. 307—272.3 **29 Claims**

1. A residual charge compensation circuit connected to circuit means, said circuit means having a node which is coupled to a power supply and in which a residual charge of a first polarity tends to remain stored on said node when said power supply is turned off, comprising:

charge storage means for storing a compensating charge of a second polarity opposite said first polarity; and



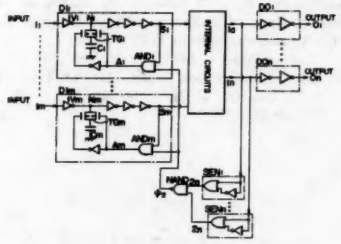
means for supplying the compensating charge to said node at a time of a turning-off of power supply.

5,151,615

NOISE ABSORBING CIRCUIT SUITABLE FOR SEMICONDUCTOR INTEGRATED CIRCUITS

Noboru Egawa, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 3, 1991, Ser. No. 725,532
Claims priority, application Japan, Jul. 13, 1990, 2-185766
Int. Cl.[5] H03K *19/00*
U.S. Cl. 307—443 **18 Claims**



1. A noise absorbing circuit comprising:

an output variation detecting circuit for detecting a variation in an output signal level of an output buffer circuit which changes from a high level to a low level;

an input level detecting circuit for detecting such a condition that an input signal line has a high voltage level;

a capacitor connected to said input signal line; and

a gate circuit connected between said capacitor and said input signal line; said gate circuit being closed so as to connect said capacitor to said input signal line if the voltage level of said input signal line is high when the output level of said output buffer circuit changes from a high level to a low level.

5,151,616

CMOS HIGH VOLTAGE SWITCH

Toshio Komuro, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 23, 1991, Ser. No. 644,655
Claims priority, application Japan, Jan. 23, 1990, 2-12975
Int. Cl.[5] H03K *17/16*
U.S. Cl. 307—451 **10 Claims**

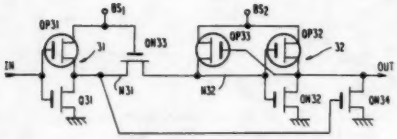
1. A semiconductor digital circuit comprising:

a first circuit section having complementary transistors connected between a first power terminal receiving a first voltage and a grounding terminal;

a second circuit section having complementary transistors

connected between a second power terminal receiving a second voltage different from said first voltage and said grounding terminal;

a first switch inserted between an output end of said first circuit section and an input end of said second circuit section operatively serving as a current path of the electric charge therebetween during a transition state of the circuit;



a second switch inserted between the input end of said second circuit section and said second power terminal and controlled by the output signal of said second circuit section; and

a third switch inserted between the output end and the grounding terminal of said second circuit section and controlled by the output signal of said first circuit section.

5,151,617

SUPERCONDUCTING LOGIC CIRCUIT

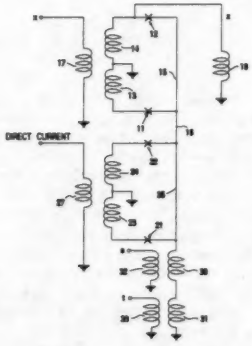
Eiichi Goto, Fujisawa; Willy Hioe, Kodaira; Mutsumi Hosoya, Kokubunji, and Ryotaro Kamikawai, Tokyo, all of Japan, assignors to Research Development Corporation of Japan and Ryotaro Kamikawai, both of Tokyo, Japan

Filed Mar. 6, 1991, Ser. No. 665,085

Claims priority, application Japan, Mar. 13, 1990, 61880

Int. Cl.[5] H03K *19/23, 19/195*

U.S. Cl. 307—462 **4 Claims**



1. A superconducting circuit comprising:

at least a periodically excited quantum flux parametron which is excited by periodically varying magnetic flux and used to amplify binary magnetic flux; and at least an arbitrarily excited quantum flux parametron which is excited by the output magnetic flux of one or more periodically excited quantum flux parametrons and used for logic operation of binary magnetic flux signals, said periodically excited quantum flux parametron and said arbitrarily excited quantum flux parametron, each comprising;

a first superconducting loop having a pair of circuits which respectively comprise a first Josephson junction and a first input inductor, and a second Josephson Junction, and a second input inductor;

an exciting line connected to the first superconducting loop;

an input line magnetically connected to said first and second input inductors;

a second superconducting loop having a pair of circuits which respectively comprise a third Josephson junction and a third input inductor, and a fourth Josephson junction and a fourth input inductor;

an exciting line connected to said second superconducting loop;

a direct current exciting input line magnetically connected to the third and the fourth input inductors; and

an output inductor connected to the first superconducting loop, wherein the exciting lines of the first and second superconducting loops are directly connected, and the output inductors of the periodically excited quantum flux parametron is magnetically connected to the exciting line of the arbitrarily excited quantum flux parametron.

5,151,618

RESONANT-TUNNELING HETEROJUNCTION BIPOLAR TRANSISTOR DEVICE

Naoki Yokoyama, and Kenichi Imamura, both of Atsugi, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

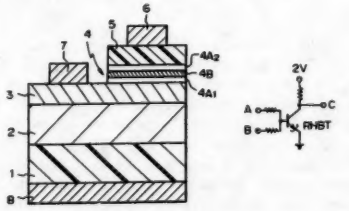
Division of Ser. No. 601,011, Oct. 22, 1990, Pat. No. 5,027,179, which is a continuation of Ser. No. 293,586, Jan. 4, 1989, abandoned, which is a continuation of Ser. No. 937,615, Dec. 3, 1986, abandoned. This application Feb. 22, 1991, Ser. No. 659,162

Claims priority, application Japan, Dec. 3, 1985, 60-270803

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.[5] H01L *29/72, 29/161, 29/105*

U.S. Cl. 307—471 **2 Claims**



1. A logic circuit comprising:

a resonant-tunneling heterojunction bipolar transistor device having a differential negative-resistant characteristic, said resonant-tunneling heterojunction bipolar transistor device comprising:

a collector semiconductor layer having a first conductivity type;

a base semiconductor layer having a second conductivity type opposite the first conductivity type, a PN junction being formed at an interface between said base semiconductor layer and said collector semiconductor layer;

an emitter semiconductor layer having the first conductivity type and formed on said base semiconductor layer;

a superlattice structure formed between said emitter semiconductor layer and said base semiconductor layer, said superlattice structure comprising:

a first barrier layer contacting said emitter semiconductor layer, an energy level of said emitter semiconductor layer being lower than that of said first barrier layer for a carrier;

a second barrier layer contacting said base semiconductor layer, an energy level of said base semiconductor layer being lower than that of said second barrier layer for the carrier; and

a quantum well layer formed between said first and second barrier layers, an energy level of said quantum well layer being lower than that of said first and second barrier layers for the carrier, said quantum well layer defining a sub-band of energy in which the carrier resonant tunnels therethrough, the carriers being electrons and holes, the electrons and holes being generated in accordance with a mole fraction of material in said emitter semiconductor layer, and the differential negative resistance characteristic having at least one resonant point in common between a current flowing in said base semiconductor layer and a voltage between said base and emitter semiconductor layers, and having at least two stable base current values on both sides of the resonant point of the characteristic defined by a changeable base-emitter voltage;

current source means ohmically-connected to said base semiconductor layer of said resonant-tunneling heterojunction bipolar transistor device for supplying a constant current to said base semiconductor layer;

load means ohmically connected to said collector semiconductor layer; and

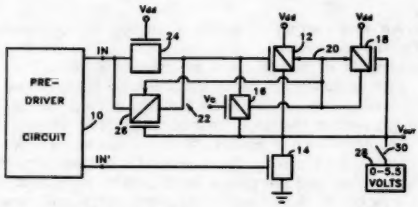
output means, operatively connected to a connection point of said load means and said collector semiconductor layer, for outputting a voltage defined by a change in current flowing through said collector semiconductor layer, the voltage being varied in response to the two stable base current values.

5,151,619

CMOS OFF CHIP DRIVER CIRCUIT

John S. Austin, Essex Junction; Ronald A. Piro, South Burlington, and Douglas W. Stout, Milton, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1990, Ser. No. 595,911
Int. Cl.[5] H03K *19/017, 19/096, 17/687, 17/04*
U.S. Cl. 307—473 **9 Claims**



1. An off-chip driver circuit comprising

a pull up transistor,

an output terminal,

voltage source means for providing a supply voltage of a given magnitude, said pull up transistor being disposed between said voltage source means and said output terminal,

a control transistor connected between a gate electrode of said pull up transistor and said output terminal having a gate electrode connected to a given point of reference potential,

a passgate including an N-channel field effect transistor having a gate electrode connected to a fixed point of reference potential and a first P-channel field effect transistor connected in parallel with said N-channel field effect transistor and having a gate electrode connected to said output terminal,

pre-driver circuit means for supplying a data in signal coupled to the gate electrode of said pull up transistor through said passgate, and

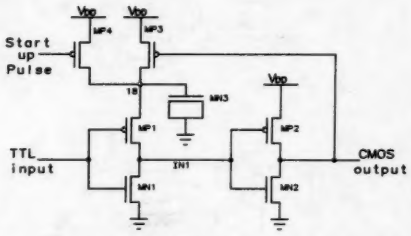
means for selectively applying a voltage to said output terminal having a magnitude significantly greater than that of said given magnitude.

5,151,620

CMOS INPUT BUFFER WITH LOW POWER CONSUMPTION

Ming-Zen Lin, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Chutung, Taiwan

Filed Mar. 25, 1991, Ser. No. 674,209
Int. Cl.[5] H03K *17/16*
U.S. Cl. 307—475 **11 Claims**



1. In an integrated circuit device having a CMOS buffer circuit of the type having an input inverter stage having two FET's designated the "upper" FET (MP1) and the "lower" FET (MN1) and an output inverter stage (MN2, MP2) connected to provide a signal in a CMOS range in response to a binary input signal in a different range, an improvement for preventing both input stage FET's from conducting when the input signal is high enough to turn on the lower FET (downMN1) but not high enough to turn off the upper FET (MP1), comprising:

a controlled power supply stage connected between a node (18) to which the source terminal of the upper FET (MN1) is connected and the corresponding power supply terminal (V_{DD}) of the device,

means connecting the controlled power supply stage to receive a controlling signal from the output inverter stage,

a capacitor (MN3) connected between the controlled power supply node and a different potential point (ground),

means in the controlled power supply stage responsive to the controlling signal to supply current for charging the capacitor when the output of the stage is at a low logic level and for interrupting the current to the node when the output of the output stage is at a high logic level,

whereby the capacitor supplies current to switch the output inverter stage when the input signal falls to a low logic level and whereby the controlled power supply stage is turned off to prevent current flow in both the upper FET and the lower FET when the input signal rises to a high logic level, and

means for initially charging the capacitor when power is first applied to the circuit power supply terminals.

5,151,621

HIGH SPEED OUTPUT BUFFER UNIT THAT PRELIMINARILY SETS THE OUTPUT VOLTAGE LEVEL

Hiroyuki Goto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 9, 1991, Ser. No. 743,061
Claims priority, application Japan, Aug. 9, 1990, 2-211225
Int. Cl.[5] H03K *19/0175*
U.S. Cl. 307—475 **6 Claims**

1. An output buffer unit comprising

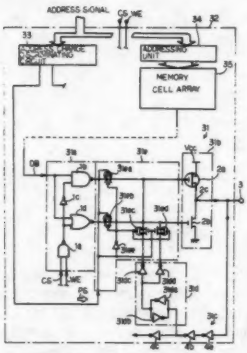
a) a controlling circuit responsive to an input signal for forming a first controlling signal,

b) a driving circuit implemented by a series combination of a first transistor of a first channel conductivity type and a second transistor of a second channel conductivity type opposite to said first channel conductivity type, said first and second transistors being complementarily shifted

between on and off states for producing an output signal at an output node between said first and second transistors,

c) a latching circuit for temporarily storing a previous output signal supplied from said output node and producing a second controlling signal, and

d) a gating circuit having a first input port coupled to said controlling circuit, a second input port coupled to said latching circuit and an output port coupled to said first



and second transistors, and responsive to a timing signal for transferring said second controlling signal to said first and second transistors in a first phase of operation for establishing an intermediate voltage level between high and low voltage levels at said output node of said driving circuit, said gating circuit being operative to supply said first controlling signal to said first and second transistors in a second phase of operation after said first phase.

5,151,622

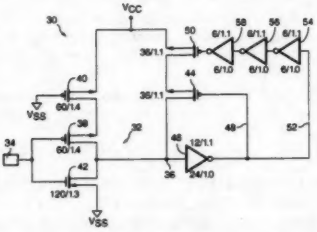
CMOS LOGIC CIRCUIT WITH OUTPUT COUPLED TO MULTIPLE FEEDBACK PATHS AND ASSOCIATED METHOD

Craig S. Thrower, San Jose, and King C. Wang, El Monte, both of Calif., assignors to Vitelic Corporation, San Jose, Calif.

Filed Nov. 6, 1990, Ser. No. 609,836

Int. Cl.[5] H03K *19/017, 19/0175*

U.S. Cl. 307—475 **25 Claims**



1. A TTL to CMOS input buffer circuit comprising:

level shifting means which includes an input terminal and an output node for receiving at the input terminal an input signal at a TTL logic voltage level and for providing at the output node an output signal at a CMOS logic voltage level, the output signal being a logically inverted version of the input signal;

first means for speeding a transition of the output signal from a low CMOS voltage level to a high CMOS voltage level; and

second means, operative throughout a transition of the output signal from the high CMOS voltage level to the low CMOS voltage level, for deactivating said first means when the output signal is static at the high CMOS voltage level and for maintaining said first means in a deactivated state throughout a transition from the high CMOS voltage level to the low CMOS voltage level.

5,151,623

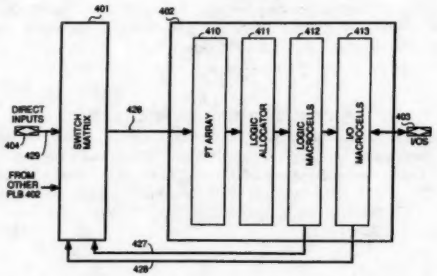
PROGRAMMABLE LOGIC DEVICE WITH MULTIPLE, FLEXIBLE ASYNCHRONOUS PROGRAMMABLE LOGIC BLOCKS INTERCONNECTED BY A HIGH SPEED SWITCH MATRIX

Om P. Agrawal, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 699,427, May 13, 1991, which is a continuation-in-part of Ser. No. 490,808, Mar. 7, 1990, Pat. No. 5,015,884, which is a continuation-in-part of Ser. No. 243,574, Sep. 12, 1988, Pat. No. 4,963,768, which is a continuation-in-part of Ser. No. 178,707, Apr. 7, 1988, Pat. No. 4,931,671, which is a continuation of Ser. No. 717,640, Mar. 29, 1985, Pat. No. 4,742,252. This application Oct. 18, 1991, Ser. No. 779,547

Int. Cl.[5] H03K *19/177*

U.S. Cl. 307—465 **37 Claims**



1. An integrated circuit having a plurality of input/output (I/O) pins comprising:

a plurality of asynchronous programmable logic blocks, each asynchronous programmable logic block having a plurality of input lines and a plurality of output lines;

programmable switch interconnection means, operatively coupled to each of said asynchronous programmable logic blocks, for receiving signals on said pluralities of output lines from said plurality of asynchronous programmable logic blocks and for providing input signals to said pluralities of input lines of said plurality of asynchronous programmable logic blocks, wherein each asynchronous programmable logic block includes:

programmable array means, operatively coupled to said programmable switch interconnection means, for (i) receiving a plurality of input signals only from said plurality of asynchronous programmable logic block input lines; (ii) generating a plurality of logic output signals in response to said plurality of input signals; and (iii) generating a plurality of control signals in response to said plurality of input signals

a plurality of programmable output logic macrocell means, each programmable output logic macrocell means, operatively coupled to said programmable switch interconnection means, having at least one input line, and output line, and a control line wherein said control line is driven by one of said plurality of control signals;

logic allocator means, operatively coupled to said programmable array means and selectively operatively coupled to and decoupled from each of said plurality of programmable logic macrocell means, for steering said plurality of output signals of said programmable array

means to selected input lined of said plurality of programmable output logic macrocell means and for decoupling said unselected input lines of said plurality of programmable output logic macrocell means from said programmable array means;

a plurality of programmable input/output (I/O) macrocells means, each I/O macrocell means, connected to one of said I/O pins, and to the output line of one of said programmable output logic macrocell means, for selectively connecting and disconnecting said programmable output logic macrocell means output line to said I/O pin; and

a plurality of programmable input logic macrocell means, each programmable input logic macrocell means, operatively coupled to said programmable switch interconnection means and to an I/O pin, having an input line and an output line wherein said input line is connected to said I/O pin and said output line is connected to said programmable switch interconnection means.

5,151,624

MULTIPLIER CIRCUIT

Michael Stegherr, Neubiberg, and Bruno Pfäffel, Höhenkirchen-Siegertsbrunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich

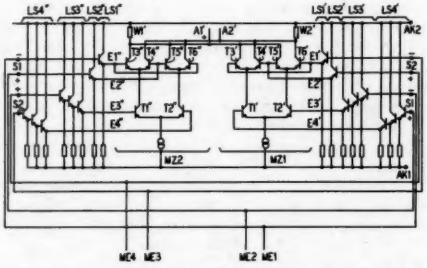
PCT No. PCT/DE90/00371, § 371 Date Nov. 5, 1991, § 102(e) Date Nov. 5, 1991, PCT Pub. No. WO90/15397, PCT Pub. Date Dec. 13, 1990

PCT Filed May 17, 1990, Ser. No. 773,556

Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917714

Int. Cl.[5] G06G *7/12, 7/00, 7/16*

U.S. Cl. 307—498 **8 Claims**



1. A multiplier circuit having a first pair and a second pair of input terminals and first and second output terminals comprising: at least first and second multiplier cells; the second multiplier cell having a lower circuit level and a downstream upper circuit level, a first pair of input terminals of the second multiplier cell assigned to the upper circuit level thereof and connected to the first pair of input terminals of the multiplier circuit, and a second pair of input terminals assigned to the lower circuit level thereof and connected to the second pair of input terminals of the multiplier circuit, the second multiplier cell connected to a first voltage terminal, the first output terminal of the multiplier circuit connected via a first resistance element to a second voltage terminal, and the second output terminal of the multiplier circuit connected to the second voltage terminal via a second resistance element, the first multiplier cell having a lower circuit level and a downstream upper circuit level, a first pair of input terminals of the first multiplier cell assigned to the upper circuit level thereof and connected to the second pair of input terminals of the second multiplier cell, and a second pair of input terminals of the first multiplier cell, assigned to the lower circuit level thereof and connected to the first pair of input terminals of the second multiplier cell, the first multiplier cell connected to the first voltage terminal, and a first output terminal of the second multiplier cell and a first output terminal of the first multiplier cell connected together and forming the first output terminal of the multiplier circuit, and a second output terminal of the second multiplier cell and a second output terminal of the first multiplier cell connected together and forming the second output terminal of the multiplier circuit.

5,151,625

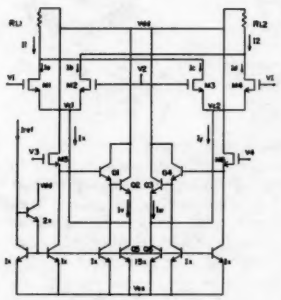
HIGH FREQUENCY BIMOS LINEAR V-I CONVERTER, VOLTAGE MULTIPLIER, MIXER

Seyed R. Zarabadi; Mohammed I. El-Naggar, and Nabil I. Khachab, all of Columbus, Ohio, assignors to The Ohio State University, Columbus, Ohio

Filed Nov. 8, 1990, Ser. No. 610,233

Int. Cl.[5] H03B *19/00*

U.S. Cl. 307—529 **20 Claims**



1. A voltage to current converter, voltage multiplier and mixer circuit comprising:

(a) at least two differential output, common source connected, pairs of matched field effect transistors having cross connected drains, the transistors which do not have their drains connected together having their gates connected together to form a first pair of voltage input nodes, the two cross connections each forming an output node providing differential output currents;

(b) a pair of impedance transformation, buffer amplifiers each amplifier comprising a low output impedance, bipolar transistor, output stage and a high input impedance field effect transistor input stage, the outputs of the output stages each respectively connected to a different one of the common sources of said differential connected pairs and the input nodes of the input stages forming a second pair of voltage input nodes; and

(c) a low impedance, bipolar transistor, constant DC current biasing circuit means connected to said common sources for biasing the field effect transistors of the differential pairs in their saturation region and biasing all bipolar transistors in their active region.

5,151,626

REPETITIVE PULSED RAMAN CELL WITH VIBRATING BLADE

Donald R. Dewhirst, Torrance, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 268,660, Nov. 2, 1988, abandoned, which is a continuation of Ser. No. 926,497, Nov. 4, 1986, abandoned. This application Feb. 19, 1991, Ser. No. 657,280

Int. Cl.[5] H01L *41/08*

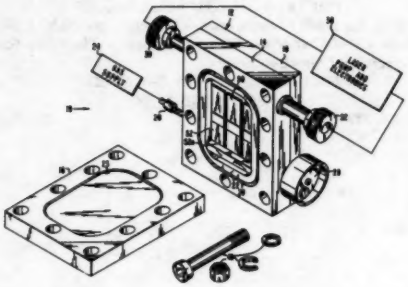
U.S. Cl. 310—331 **6 Claims**

1. In a Raman gas cell comprising: a sealed enclosure,

a gas contained within said sealed enclosure under pressure for providing a Raman conversion process, and means defining a laser beam path through said gas within said sealed enclosure;

and wherein a laser beam traversing said path and having a focus within said sealed enclosure is subject to optical distortion by heating of said gas from the Raman conversion process along said beam path;

the improvement consisting of at least one vibrating blade and means for driving said vibrating blades, said vibrating blades being positioned centrally within said sealed enclosure spanning approximately one-third of said beam path to agitatingly disturb said gas within said beam path so that a thermally homogeneous mixture of said agitated gas is provided within said beam path to thereby prevent optical distortion of said focused laser beam caused by localized heating of said gas from the Raman conversion process along said beam path.



5,151,627

CATHODE RAY TUBE HAVING STRONG DISPLAY WINDOW AND DISPLAY DEVICE

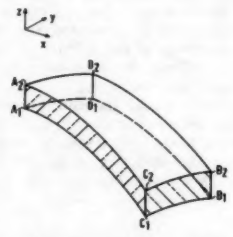
Johannes C. A. Van Nes, and Johannes Penninga, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1991, Ser. No. 653,954

Claims priority, application Netherlands, Feb. 12, 1990, 9000325

Int. Cl.[5] H01J *31/00, 29/86*

U.S. Cl. 313—477 R **22 Claims**



1. A cathode ray tube comprising a display window, an electron gun and a display screen provided on an inner surface of the display window, characterized in that the thickness D_x of the display window along the long axis is defined by:

$$D_x = D_O + \Delta(x)$$

and the thickness D_y of the display window along the short axis is defined by:

$$D_y = D_O + \Delta(y),$$

where D_O is the thickness of the display window in the center of the display window and $\Delta(x)$ and $\Delta(y)$ are the increases in thickness along the long (x) axis and the short (y) axis, respectively, for which it holds that:

$$\Delta(y)_{max} > 1.5\Delta(x)_{max},$$

where $\Delta(x)_{max}$ and $\Delta(y)_{max}$ are maximum increases in thicknesses along the long (x) axis and the short (y) axis, respectively.

5,151,628

LIGHT EMITTING DIODE FOR PHOTOSENSOR AND PHOTOSENSOR WITH SUCH A DIODE

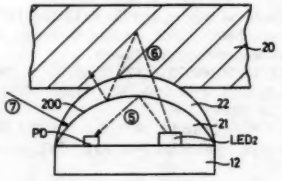
Masahiko Osawa, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 15, 1991, Ser. No. 745,152

Claims priority, application Japan, Aug. 27, 1990, 2-89655[U]; Aug. 27, 1990, 2-89656[U]

Int. Cl.[5] H01J *63/04*

U.S. Cl. 313—499 **8 Claims**



1. A light emitting diode for a photosensor, comprising: a substrate (**12**), a light emitting element provided on said substrate (**12**), a light receiving element disposed on said substrate (**12**) in the vicinity of said light emitting element for receiving light emitted by said light emitting element to detect a change in the amount of the light coming from said light emitting element in response to a change in ambient temperature, a first transparent layer (**21**) provided on said substrate (**12**) to cover said light emitting element and said light receiving element (PD), a second transparent layer (**22**) provided on said first transparent layer (**21**), and an air layer interposed between said first and said second transparent layers for substantially eliminating adverse influences of ambient temperature drifts on a measurement.

5,151,629

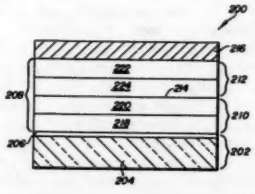
BLUE EMITTING INTERNAL JUNCTION ORGANIC ELECTROLUMINESCENT DEVICE (I)

Steven A. VanSlyke, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1991, Ser. No. 738,776

Int. Cl.[5] H05B *33/26*

U.S. Cl. 313—504 **25 Claims**



1. An internal junction organic electroluminescent device comprised of, in sequence, an anode, an organic hole injecting and transporting zone, an organic electron injecting and transporting zone, and a cathode,

characterized in that said organic electron injecting and transporting zone is comprised of

an electron injecting layer in contact with the cathode and, interposed between the electron injecting layer and the organic hole injecting and transporting zone, a blue emitting luminescent layer comprised of a charge accepting compound of the formula:

$$(R^2—Q)_2—Al—O—Al—(Q—R^2)_2$$

where

Q in each occurrence represents a substituted 8-quinolinolato ring nucleus and

R^2 represents an 8-quinolinolato ring substituent chosen to block sterically the attachment of more than two substituted 8-quinolinolato ring nuclei to any one aluminum atom.

5,151,630

TRIGGERABLE SWITCHING SPARK GAP

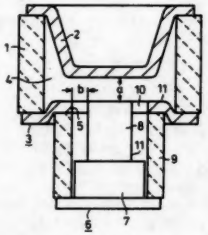
Jürgen Boy, and Matthias Jacubeit, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 31, 1990, Ser. No. 606,150

Claims priority, application European Pat. Off., Nov. 2, 1989, 89250072.9

Int. Cl.[5] H01J *17/30*

U.S. Cl. 313—602 **1 Claim**



1. A triggerable switching spark gap for switching a voltage of approximately 2 kV, comprising:

a) a first main electrode having a flat discharge surface and a circular opening, said first main electrode being coated with an activating mass of silver or with a eutectic silver-aluminum compound constituent of approximately 10% to 40% by weight;

b) a second main electrode having a flat discharge surface;

c) an insulator disposed between the first main electrode and the second main electrode;

d) a gas-discharge space formed between the insulator, and the first and second main electrodes;

e) a cylindrical trigger electrode disposed inside the center of the circular opening and flush with the flat discharge surface of the first main electrode, forming a ring gap therebetween, having a circumferential edge with a radius of curvature less than or equal to 0.1 mm, and being coated with an activating mass of silver or with an eutectic silver-aluminum compound constituent of approximately 10% to 40% by weight, wherein a spacing between said first and second main electrodes is greater by a factor of 1.4 to 1.7 than a width of said ring gap.

5,151,631

LIGHTING CIRCUIT FOR VEHICULAR DISCHARGE LAMP

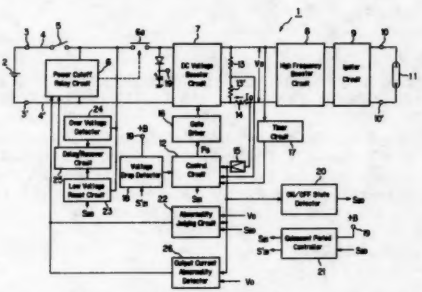
Goichi Oda; Atsushi Toda; Soichi Yagi, and Hiroki Shibata, all of Shimizu, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1991, Ser. No. 760,420

Claims priority, application Japan, Oct. 19, 1990, 2-281324

Int. Cl.[5] H05B *37/00*; B60Q *1/02*

U.S. Cl. 315—127 **10 Claims**



1. A lighting circuit for a vehicular discharge lamp for lighting a discharge lamp using a DC power supply, comprising:

an OFF state detector for detecting an OFF status of a discharge lamp;

a DC input voltage detector for detecting whether or not a DC input voltage is within a predetermined range; and

a power cutoff means for inhibiting power supply to the discharge lamp when the OFF status of the discharge lamp is detected by the OFF state detector and the DC input voltage lying off the predetermined range is detected by the DC input voltage detector, and permitting power supply to the discharge lamp upon reception of a signal indicating that the DC input voltage has returned within the predetermined range.

5,151,632

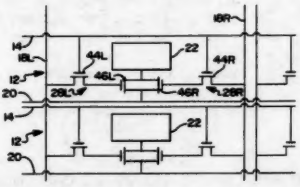
FLAT PANEL EMISSIVE DISPLAY WITH REDUNDANT CIRCUIT

John R. Troxell, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 22, 1991, Ser. No. 673,611

Int. Cl.[5] G09G *3/10*; G02F *1/13*

U.S. Cl. 315—169.1 **1 Claim**



1. A flat panel emissive display comprising:

a matrix of pixels arranged in rows and columns, each pixel comprising means for emitting light when pixel current is applied thereto;

at leas tone row electrode of each row of pixels;

a plurality of column electrodes for each column of pixels, each pixel having at least one corresponding row electrode and a plurality of corresponding column electrodes, the plurality of column electrodes for each column of pixels comprising a single conductor with sufficient resis-

tance to localize a short circuit condition of one of the column electrodes;

driver means for selectively energizing the row electrodes corresponding to selected rows of pixels and the pluralities of column electrodes corresponding to selected columns of pixels; and

redundant sets of transistors means coupled to each pixel for jointly supplying pixel current, each set of transistor means being connected to at least the one row electrode and to one of the corresponding column electrodes such that each pixel is normally activated by signals from the one row electrode and at least one of the column electrodes.

5,151,633

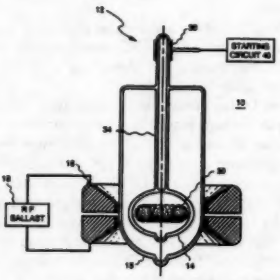
SELF-EXTINGUISHING GAS PROBE STARTER FOR AN ELECTRODELESS HIGH INTENSITY DISCHARGE LAMP

George A. Farrall, Rexford; John P. Cocoma, Clifton Park, both of N.Y.; James T. Dakin; Mark E. Duffy, both of Shaker Heights, Ohio, and Tommie Berry, Jr., East Cleveland, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1991, Ser. No. 812,266

Int. Cl.[5] H05B *41/16*

U.S. Cl. 315—248 **13 Claims**



1. A gas probe starter for an electrodeless high intensity discharge lamp of the type having an excitation coil situated about an arc tube for exciting an arc discharge in an ionizable fill contained in said arc tube, comprising:

a starting chamber having a wall enclosing an interior containing a starter fill, said starting chamber being attached to the outer wall of said arc tube;

a starting electrode disposed proximate to the portion of said starting chamber opposite to the portion that is attached to said arc tube for coupling a starting voltage to the interior of said starting chamber;

means for coupling said starting voltage to said starting electrode for initiating a starting discharge in said starting chamber that in turn initiates an arc discharge in said arc tube; and

said starter fill including electronegative means for extinguishing the starting discharge in said starting chamber after initiation of said arc discharge in said arc tube.

5,151,634

DEVICE FOR CONTROLLING A GAS-DISCHARGE LAMP FOR USE IN A MOTOR VEHICLE

Andrea Nepote, Turin, and Marcello Boella, Ivrea, both of Italy, assignors to Marelli Autronica SpA, Milan, Italy

Filed Oct. 21, 1991, Ser. No. 779,858

Claims priority, application Italy, Oct. 22, 1990, 67812 A/90

Int. Cl.[5] H05B *37/02, 41/36*

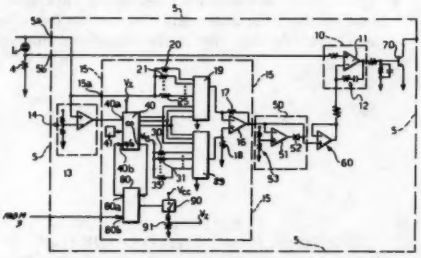
U.S. Cl. 315—307 **7 Claims**

1. A device for controlling a gas-discharge lamp for use in a motor vehicle, including:

a supply device for the lamp, having an input for connection to the battery of the vehicle and an output for connection to the lamp and including an inverter with a control input for receiving a control signal which can modify the electrical power supplied to the lamp, and

regulating circuitry connected to the lamp and to the control input of the supply circuit for detecting the voltage across the lamp and the current flowing through the lamp and for applying to the control input of the supply device a control signal for causing a high electrical power to be supplied during the switching-on and warming-up of the lamp and a subsequent reduction of the power to a predetermined operating level;

the regulating circuitry comprising:



means for generating signals indicative of a reference current which is variable in steps and, during successive time intervals defined by a clock-signal generator, decreases according to respective predetermined functions as the voltage detected across the lamp increases, wherein the functions correspond to respective predefined constant values of the power supplied to the lamp, and

comparator means for comparing the reference-current values generated with the current detected in the lamp and, in dependence on the difference between them, generating an error signal usable for generating the control signal for the supply device.

5,151,635

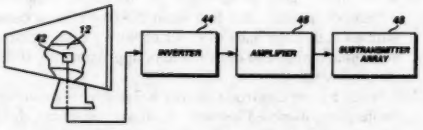
APPARATUS AND METHOD FOR REDUCING THE MAGNITUDE OF TIME VARYING ELECTRIC FIELDS IN CRT DISPLAYS

Richard D. Cappels, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Jun. 20, 1991, Ser. No. 717,946

Int. Cl.[5] G09G *1/04;* H01J *29/06, 1/52*

U.S. Cl. 315—370 **20 Claims**



1. An electric field cancellation system for use in a CRT display comprising:

means for determining the magnitude and polarity of a source electric field in the display and developing a counter electrical signal of opposite polarity to the polarity of said source field; and,

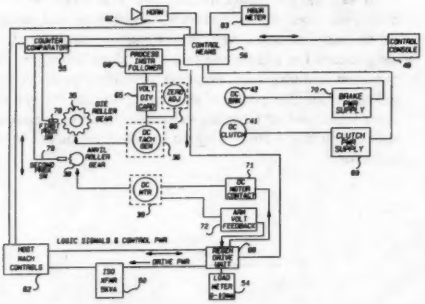
counter electric field transmitting means, coupled to said determining and developing means, for using said counter-signal to establish a counter electric field of opposite polarity to said source field in a manner such that said counter electric field couples with said source electric field to produce a resultant electric field of substantially reduced magnitude in comparison to the magnitude of said

source field, thereby reducing electric field emission from the display.

5,151,636
ROTARY DIE CUTTING APPARATUS AND METHOD WITH DISCONNECT

Kennith N. Winebarger, 2007 Woodbriar Loop South, Lakeland, Fla. 33813

Filed Mar. 12, 1990, Ser. No. 493,064
Int. Cl.[5] H02P *3/00*
U.S. Cl. 318—272 **42 Claims**



1. A rotary die cutting apparatus of the type having a power driven die roller mounted for rotary motion perpendicular to an axis of travel, and an anvil roller mounted for rotary motion in a spaced parallel relationship to said die roller, said rotary die cutting apparatus having a controller generating a feed signal in response to cardboard being fed into said rotary die cutting apparatus, the improvement comprising:

a) means for driving said anvil roller at a speed substantially the same speed as said die roller,

b) means for mechanically disconnecting said anvil roller from said means for driving, and

c) means for controlling said means for driving and said means for disconnecting in response to said controller generating said feed signal to prevent the shearing and crushing of said cardboard.

5,151,637
DECELERATION APPARATUS FOR MOTOR AND DRIVE CIRCUIT FOR USE IN MOTOR DECELERATION APPARATUS OR CONTROL APPARATUS FOR USE IN SEWING MACHINE

Kazuaki Takada, Katsuta; Masayuki Kanari, Iwaki; Makoto Yajima, and Eiji Toyoda, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Taga Engineering Co., Ltd., Hitachi, both of, Japan

Filed Apr. 5, 1990, Ser. No. 504,864
Claims priority, application Japan, Apr. 19, 1989, 1-97343
Int. Cl.[5] H02P *3/14*
U.S. Cl. 318—376 **16 Claims**

1. A drive circuit for a motor, comprising:

motor drive means for driving a brushless multi-phase DC motor, the motor drive means including an inverter circuit including a plurality of switching elements; and

rotation speed control means for controlling the plurality of switching elements to drive the motor at a rotation speed specified by a rotation speed command in an operating mode, and to regeneratively brake the motor in a braking mode;

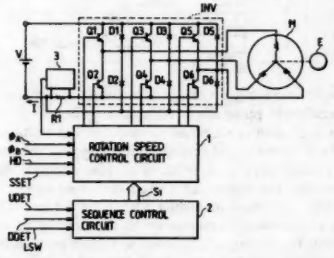
wherein the rotation speed control means controls the plurality of switching elements in the braking mode to regeneratively brake the motor intermittently in an intermittent braking mode during an initial braking period until the motor has decelerated to a predetermined rotation speed, and to regeneratively brake the motor continuously in a continuous braking mode during a subsequent braking period after the motor has decelerated to the predetermined rotation speed.

13. A drive circuit for a motor, comprising:

motor drive means for driving a brushless multi-phase DC motor, the motor drive means including an inverter circuit including a plurality of switching elements; and

rotation speed control means for controlling the plurality of switching elements to drive the motor at a rotation speed specified by a rotation speed command in an operating mode, and to regeneratively brake the motor in a braking mode; and

wherein the rotation speed control means controls the plurality of switching elements in the braking mode to provide a relatively small regenerative braking current to the motor for decelerating the motor during an initial braking period, and to provide a relatively large regenerative



braking current to the motor for decelerating the motor during a subsequent braking period.

15. In a sewing machine having a brushless multi-phase DC motor, a control apparatus comprising:

motor drive means for driving the motor of the sewing machine, the motor drive means including an inverter circuit including a plurality of switching elements; and

rotation speed control means for controlling the plurality of switching elements to drive the motor at a rotation speed specified by a rotation speed command in an operating mode, and to regeneratively brake the motor in a braking mode; and

wherein the rotation speed control means controls the plurality of switching elements in the braking mode to provide a relatively small regenerative braking current to the motor and to provide a relatively large regenerative braking current to the motor for decelerating the motor during a subsequent braking period.

5,151,638
MOTOR OVERLOAD INDICATING ARRANGEMENT

Howard L. Beckerman, Middletown, N.J., assignor to Atlas Roll-Lite Door Corporation, Edison, N.J.

Filed Aug. 12, 1991, Ser. No. 743,939
Int. Cl.[5] H02P *7/36*
U.S. Cl. 318—434 **9 Claims**

1. An arrangement for indicating an overload condition of an AC motor, the overload condition being defined when the phase angle difference between the current and voltage within a single phase of the motor decreases below a predetermined threshold, the arrangement comprising:

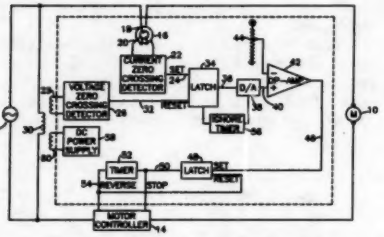
a saturable ferromagnetic core having a main winding in series with said single phase of the motor so that the motor current of said single phase passes through said main winding and a sense winding arranged to provide a first pulse of a first polarity when said motor current changes polarity in a first direction and a second pulse of a second polarity when said motor current changes polarity in a second direction;

means receiving said first and second pulses for providing a

current zero crossing pulse upon receipt of either said first or said second pulse;

means for providing a voltage zero crossing pulse in response to each zero crossing of the motor voltage of said single phase;

means utilizing said current zero crossing pulse and said voltage zero crossing pulse for providing a phase angle difference pulse initiated by each said current zero crossing pulse and terminated by each said voltage zero crossing pulse;



means for deriving a voltage representative of the duration of each said pulse angle difference pulse;

means activated in response to said derived voltage exceeding a predetermined threshold for stopping the motor; and

means responsive to activation of said stopping means for reversing the motor for a predetermined time;

said stopping means including a latch circuit and said reversing means being responsive to the setting of said latch circuit for timing a first interval and, after said first interval, reversing the motor for said predetermined time and resetting said latch circuit.

5,151,639

SYSTEM FOR POSITIONING A TRANSDUCER

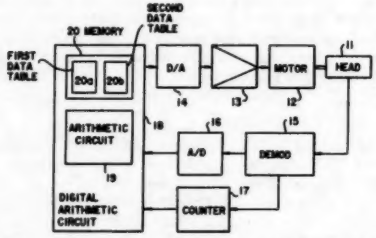
Susumi Hasegawa, Kawasaki; Yoshifumi Mizoshita, Tama, and Kazuhiko Takaishi, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 8, 1991, Ser. No. 652,822

Claims priority, application Japan, Feb. 9, 1990, 2-28197

Int. Cl.[5] G05B *19/407*

U.S. Cl. 318—568.18 **9 Claims**



1. A system for positioning a control object comprising:

an actuator for moving and positioning said control object to a designated position;

an arithmetic control means for controlling a drive means of said actuator, wherein said arithmetic control means includes

target positioning means for determining a target position of each sample period in time for a target position generated based on acceleration and deceleration patterns which minimize a squared differential value of an acceleration of said control object,

target velocity means for computing a target velocity of each sample period in time for a target velocity generated based on acceleration and deceleration patterns which minimize said squared differential value of said acceleration of said control object, and

target acceleration means for computing a target acceleration of each sample period in time for a target acceleration generated based on acceleration and deceleration patterns which minimize said squared differential value of said acceleration of said control object;

position estimating means for estimating position of each sample period of said control object;

velocity estimating means for estimating velocity of each sample period of said control object;

error computing means for computing at least one error between the target position and target velocity output from said target positioning means and target velocity means and position and velocity output from said position estimating means and velocity estimating means; and

adding means for adding the target acceleration signal output from said target acceleration means and position error output from the position estimating means or velocity error signal output from the velocity estimating means and then outputting a control signal to said drive means of said actuator.

5,151,640

SCANNING DEVICE HAVING A MEMORY FOR STORING DRIVING STEPS FOR A STEPPING MOTOR

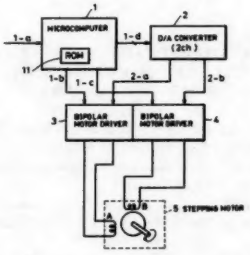
Masahiro Sakamoto, and Junnosuke Kataoka, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1990, Ser. No. 607,049

Claims priority, application Japan, Oct. 31, 1989, 1-281648; Oct. 31, 1989, 1-281649; Oct. 31, 1989, 1-281650

Int. Cl.[5] H02P *8/00*

U.S. Cl. 318—696 **12 Claims**



1. A scanning device comprising:

a stepping motor driven by microsteps;

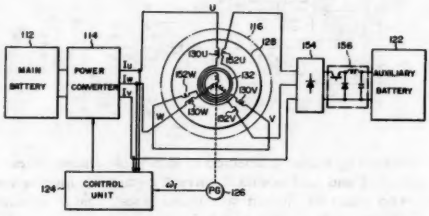
a memory for storing predetermined microstep drive information which indicates values and directions of phase currents supplied to said stepping motor, said microstep drive information being stored in a plurality of areas of a table which is provided in said memory, the number of said areas corresponding to a denominator which represents designated magnification ratios which are expressed as a fraction; and

a motor driver for successively reading corresponding items of said microstep drive information from said memory in accordance with a designated magnification ratio.

5,151,641
ELECTRIC AUTOMOBILE DRIVING APPARATUS

Sumikazu Shamoto, Suntou, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 6, 1990, Ser. No. 563,209
Claims priority, application Japan, Aug. 21, 1989, 1-215706
Int. Cl.[5] H02P *3/18*
U.S. Cl. 318—762 **20 Claims**



1. An electric automobile driving apparatus comprising:

a) a main battery for outputting a DC voltage having a predetermined value;

b) an inverter for converting said DC voltage output from said main battery into the same number of alternating currents as a predetermined number of phases;

c) a motor provided with the same number of primary coils as said predetermined number of phases for converting said alternating currents which are output from said inverter into a magnetic field and a secondary coil disposed in close proximity to at least one of said primary coils so that said magnetic field generated by said primary coils induces a secondary voltage in aid secondary coil, the magnetic filed also inducing a torque on a rotor of said motor;

d) a control unit for driving said motor by alternating said alternating currents output from said inverter;

e) an auxiliary battery for supplying an auxiliary voltage to electric appliances installed in an electric automobile; and

f) a rectifier for converting said secondary voltage into a DC voltage having a predetermined value as a charging voltage, and charging said auxiliary battery with, and driving said electrical appliances by, said charging voltage.

5,151,642
APPARATUS FOR CONTROLLING AN ELECTRIC MOTOR

Steven A. Lombardi, Waukesha, and Richard D. Marasch, Germantown, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed May 3, 1990, Ser. No. 518,352
Int. Cl.[5] H02P *1/28*
U.S. Cl. 318—779 **17 Claims**

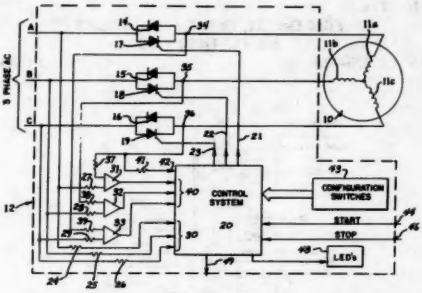
1. An apparatus for controlling the application of electricity to an alternating current electric motor comprising:

a switch means coupling the electric motor to a source of alternating electricity and being of a type which is conductive from the moment of application of a trigger pulse until the magnitude of alternating current therethrough goes to zero;

means for detecting a periodically occurring condition of the alternating electricity from the source, and producing a control signal indicating an occurrence of the condition;

means for producing a clock signal having a frequency which varies at different rates to alter the amount of electricity applied by said switch means to the motor;

a means for generating a count of cycles of the clock signal and producing a trigger pulse when the count reaches a first predefined number, said means for generating being coupled to said means for detecting to set the count to a



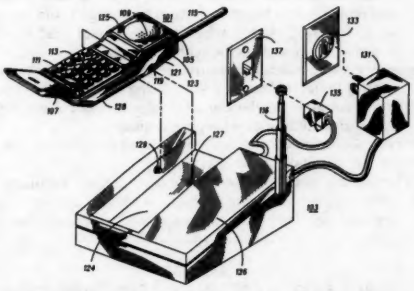
second predefined number in response to the control signal; and

means for applying the trigger pulse to said switch means.

5,151,643
INTEGRAL HANG-UP AND BATTERY CHARGING APPARATUS

Steven C. Emmert, Arlington Heights; Carlson, Kenneth W., Hawthorn Woods; Louis J. Lundell, Buffalo Grove; Nicholas Mischenko, Mt. Prospect; Terrance N. Taylor, Barrington, and Albert L. Nagele, Wilmette, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 4, 1991, Ser. No. 664,145
Int. Cl.[5] H01M *10/16*
U.S. Cl. 320—2 **32 Claims**



1. A base unit for charging a rechargeable electrical energy storage medium, the base unit comprising:

a housing enclosing an electrical energy supply;

a first side of the housing having an indentation disposed therein, said indentation having at least a first surface and a second surface, whereby the rechargeable electrical energy storage medium may be removably placed at least partially within said indentation;

first and second conductive protrusions disposed on said first and second surfaces, respectively;

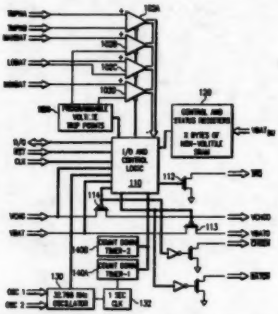
means for coupling said electrical energy supply to said first and second conductive protrusions, whereby the rechargeable electrical energy storage medium may be charged by said electrical energy supply; and

means for retracting said first and second conductive protrusions at least partially within said first surface and said second surface, respectively, of said indentation.

5,151,644
BATTERY MANAGER CHIP WITH CRYSTAL-CONTROLLED TIME BASE

Ronald W. Pearson, Denton, and Brian W. Jones, Garland, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Dec. 21, 1990, Ser. No. 632,378
Int. Cl.[5] H02J 7/00
U.S. Cl. 320—14 **3 Claims**



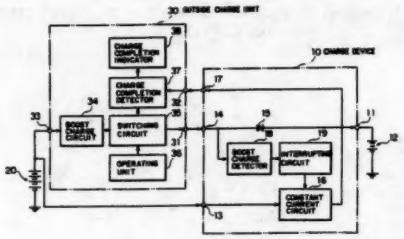
1. A battery management integrated circuit, comprising:
connections for ground, for a source of current, for an electrical load, for a high-Q crystal, and for a hot terminal of a rechargeable battery;
a first switch configured to selectively connect the source of current to the hot terminal;
a second switch configured to selectively connect the hot terminal to the electrical load;
a plurality of comparators, including at least one comparator connected to detect when the voltage of the hot terminal becomes smaller than a predetermined first voltage;
control logic, with inputs connected to outputs of said comparators, and configured to turn on said first switch when said rechargeable battery needs to be charged, and to turn on said second switch when said electrical load can be powered from said rechargeable battery;
memory space including control registers accessible to said control logic, said control logic being configured to operate in response to the contents of said control registers, and also including timekeeping registers;
a crystal-controlled oscillator connected to generate digital signals at regular time intervals;
wherein the output of said crystal-controlled oscillator is connected to said control logic, and said control logic updates said timekeeping registers with reference thereto.

5,151,645
CHARGE DEVICE CAPABLE OF LENGTHENING A LIFETIME OF A STORAGE CELL

Yukio Murata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 23, 1991, Ser. No. 644,656
Claims priority, application Japan, Jan. 23, 1990, 2-12845
Int. Cl.[5] H02J 7/00
U.S. Cl. 320—23 **3 Claims**

1. A charge device comprising:
a storage cell terminal to be connected to a storage cell to be charged; a trickle charge terminal for receiving a trickle charge voltage;
a boost charge terminal connected to said storage cell terminal for receiving a boost charge voltage;
a constant current circuit connected between said storage cell terminal and said trickle charge terminal for causing a constant current to flow from said trickle charge terminal to said storage cell terminal;
boost charge detector means connected to said boost charge terminal for detecting said boost charge voltage to produce a boost charge signal when said boost charge terminal is supplied with said boost charge voltage; and

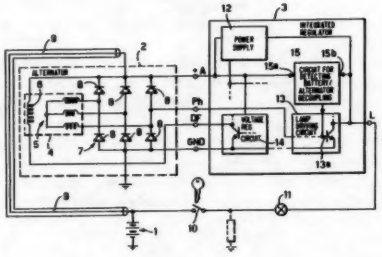


interrupting means connected to said boost charge detector means and said constant current circuit for interrupting said constant current when said boost charge detector means produces said boost charge signal.

5,151,646
BATTERY-RECHARGING SYSTEM FOR A MOTOR VEHICLE

Roberto Vercesi, and Roberto Bettini, both of Turin, Italy, assignors to Marelli Autronica SpA, Milan, Italy

Filed Mar. 22, 1991, Ser. No. 673,558
Claims priority, application Italy, Mar. 22, 1990, 67210 A/90
Int. Cl.[5] H02J 7/04
U.S. Cl. 322—28 **4 Claims**



1. A battery-recharging system for a motor-vehicle, including,
a generator comprising an alternator with a polyphase armature winding, a field winding and a polyphase rectifier whose output is connected to a terminal of a battery by a conductor;
a switch connected to said terminal of the battery;
an indicator lamp connected with the switch; and
a control and regulator circuit for regulating a voltage output by the generator and for controlling operation of the indicator lamp;
the control and regulator circuit including:
a voltage regulating circuit having an input coupled to the output of said rectifier through a first terminal of said control and regulator circuit, and an output coupled to the field winding through a second terminal of the control and regulator circuit;
a lamp driving circuit, independent of said voltage regulating circuit and having an input coupled to one phase of the armature winding of the generator through a third terminal of said control and regulator circuit, and one phase of said rectifier and
a voltage monitoring circuit having a first input coupled to said first terminal of the control and regulator circuit, and

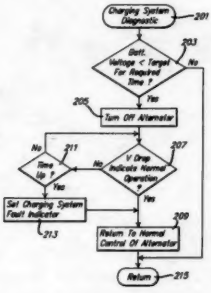
a second, separate, input coupled to the battery through the switch and the indicator lamp; said voltage monitoring circuit being arranged for switching on the indicator lamp if the potential difference between the first and second inputs thereof is greater than a reference value when the generator is operating.

5,151,647

ENHANCED CHARGING SYSTEM DIAGNOSTIC METHOD

Douglas C. Frantz, Lake Orion, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 15, 1991, Ser. No. 700,748
Int. Cl.[5] H02K *11/00*
U.S. Cl. 322—99 **16 Claims**



1. In a charging system for a vehicle having a battery and an alternator for charging the battery, a method for detecting full and partial alternator charging output failure comprising the steps of:

(a) monitoring output voltage of the battery;

(b) monitoring vehicular engine rotational speed;

(c) determining a desired minimum difference between the monitored battery output voltage and a target battery voltage level, the difference being a function of the vehicular engine rotational speed;

(d) turning off the alternator whenever the monitored battery voltage differs from the target voltage by an amount greater than the desired minimum difference;

(e) determining a minimum acceptable battery voltage drop in the absence of alternator charging current, the minimum acceptable battery voltage drop being a function of the vehicular engine rotational speed; and

(f) indicating a charging system fault whenever th minimum acceptable battery voltage drop is not present in the absence of alternator charging current.

5,151,648

SCINTILLATION TUBE DYNAMIC CALIBRATION MONITOR AND FEEDBACK REGULATOR

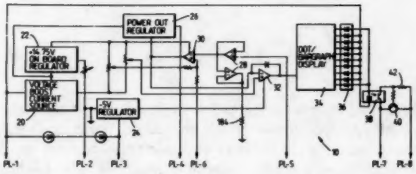
David E. Sharpe, Chesterfield, Va., assignor to Philip Morris Inc., New York, N.Y.

Filed Jul. 23, 1990, Ser. No. 557,123
Int. Cl.[5] G01J *1/44*
U.S. Cl. 323—282 **17 Claims**

1. A scintillation tube dynamic calibration monitor and regulator device comprising:

power out voltage regulator means including output means for providing a drive signal for an external high voltage power supply;

feedback means for dynamically adjusting said power out voltage regulator means, including first input means for receiving a high voltage feedback signal, and coarse calibration adjustment means for setting a calibration reference voltage, said feedback means being electrically connected to said power out voltage regulator means; and



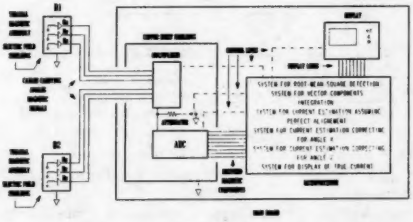
display means electrically connected to said feedback means for visually displaying present calibration status relative to said calibration reference voltage.

5,151,649

PAIR OF ELECTRICALLY SHIELDED TRIAXIAL MAGNETIC SENSORS FOR DETERMINATION OF ELECTRIC CURRENTS IN CONDUCTORS IN AIR WITH DISTANCE AND ANGLE COMPENSATION

Paul Héroux, 921 Jean-Paul Vincent, apt 6, Longueuil, Québec, Canada J4G 1V1

Continuation-in-part of Ser. No. 468,628, Jan. 23, 1990, abandoned. This application Apr. 5, 1991, Ser. No. 680,826
Int. Cl.[5] G01R *19/00, 19/08, 33/022*
U.S. Cl. 324—127 **2 Claims**



1. An instrument designed to measure electric current flowing in a linear electrical conductor, the current thereby causing around the conductor a gradient of magnetic flux density, comprising

a) two assemblies of three orthogonal magnetic transducers at a set distance from each other, said two assemblies of three transducers being aligned on an axis normal to the electric conductor carrying the current, each assembly being used for the determination of the local magnetic flux density components x, y, z at two different locations within the instrument, the magnetic flux density components x, y, z at each location being represented by three electrical signals given by the three transducers of the corresponding assembly respectively;

b) means to shield each of said magnetic transducers against electric fields originating from the conductor passing the current to be measured; and

c) means to process said signals, said means including:

precision electronic amplifier circuitry for amplifying each of said six signals;

multiplexer-Analog-to-Digital-Converter combination for digitizing each of the amplified signals; and

a microprocessor, for finding the root-means-square value of each of said six signals, generating from the root-means-square values the vectorial sum of the components x, y, z at each assembly location to determine the amplitude value of the magnetic flux density vector at

each said assembly location, processing the amplitude values of said magnetic flux density vectors determined at said assembly locations into an electric current value using the equation

$$I = \frac{kB_1}{20\left(\frac{B_1}{B_2} - 1\right)},$$

wherein B_1 represents the magnetic flux density vector at one of said assembly locations, B_2 represents the magnetic flux density vector at the other of said assembly locations and k is the distance between said assembly locations, and displaying said current value.

5,151,650

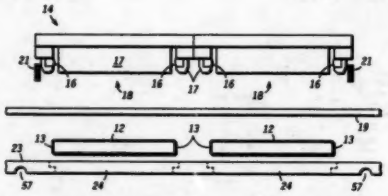
PACKAGED SEMICONDUCTOR DEVICE HANDLER

Milo W. Frisbie; Larry A. Nickerson, and Mavin C. Swapp, all of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 3, 1991, Ser. No. 753,455

Int. Cl.[5] G01R *31/28*; B07C *5/344*

U.S. Cl. 324—158 F **17 Claims**



14. A method for testing a number of semiconductor devices having a plurality of leads extending therefrom, the method comprising:

providing a test head having a plurality of contacts extending therefrom and said test head having a number of test pockets for holding the packaged semiconductor devices during testing;

providing a first boat having the same number of compartments as the number of semiconductor devices;

providing a boat travel path having an input staging section, a testing section which is adjacent to the test head, and an output staging section;

placing the number of semiconductor devices in the first boat;

positioning the first boat in the input staging section;

providing a first transport means moving between the input staging section and the testing section;

attaching the first boat to the first transport means;

indexing the first boat from the input staging section to the testing section;

coupling the plurality of contacts to the plurality of leads;

testing the semiconductor devices in the first boat

positioning a second boat in the input staging section;

returning the first transport means to the input staging section;

attaching the second boat to the first transport means;

providing a second transport means moving between the testing section and the output staging section;

attaching the first boat to the second transport means; and

simultaneously indexing the first boat to the output staging section and the second boat to the testing section.

5,151,651

APPARATUS FOR TESTING IC ELEMENTS

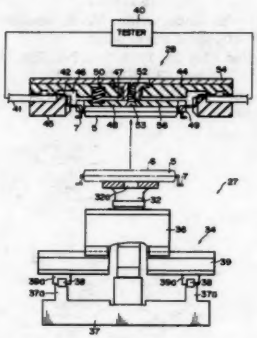
Junichirou Shibata, Urawa, Japan, assignor to Tokyo Electron Limited, Tokyo and Tokyo Electron Yamanashi Limited, Nirasaki, both of, Japan

Filed Jul. 11, 1991, Ser. No. 728,275

Claims priority, application Japan, Aug. 16, 1990, 2-216188

Int. Cl.[5] G01R *31/00*

U.S. Cl. 324—158 P **29 Claims**



1. An apparatus for testing IC elements each having a mold and leads, comprising:

holding means for holding an IC element;

contact section having probes to be contacted with leads of said IC element and supporting means for supporting said probes;

contact means for moving at least one of said holding means and said contact section to cause them to approach each other and contacting said leads of said IC element to said probes; and

a mold guide provided adjacent said supporting means and movable toward said supporting means, said mold guide comprising an edge portion formed with grooves for receiving said probes and aligning means for aligning said IC element with said mold guide when said leads are contacted with said probes.

5,151,652

MEASURING POSITION FOR MICROWAVE COMPONENTS

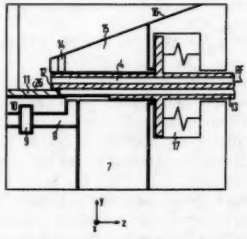
Hugo Moschuering, Hoehenkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 28, 1990, Ser. No. 589,214

Claims priority, application European Pat. Off., Sep. 29, 1989, 89118084

Int. Cl.[5] G01R *1/02*

U.S. Cl. 324—158 P **13 Claims**



1. Measuring position for a microwave component, having a

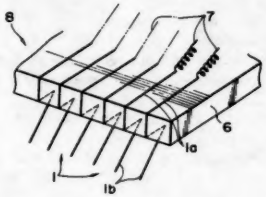
carrier for the microwave component and at least one test probe, comprising spatial positions of the at least one test probe being variable and adjustable in three spatial dimensions relative to a spatial position of the carrier, at least the one test probe being variable and adjustable in three spatial dimensions, and the at least one test probe having a structure for exerting mechanical pressure onto the microwave component such that a nose of the at least one test probe substantially contacts the microwave component.

5,151,653

INSPECTION PROBE HAVING THIN METAL WIRES WITH SELF RESILIENCY

Toshiaki Yutori, Takasago, and Yutaka Kanetsuki, Akashi, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Mar. 8, 1991, Ser. No. 666,806
Claims priority, application Japan, Mar. 8, 1990, 2-57445
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—158 P **4 Claims**



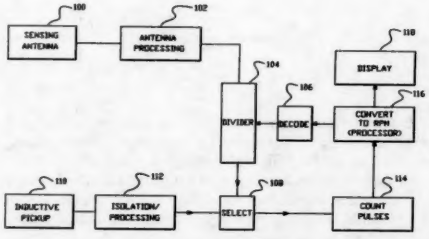
1. An inspection probe comprising:
a base; and
a plurality of thin metal wires having mounting portions mounted to said base, each of said wires having a diameter of no more than 120 μm, being formed from a low carbon two-phase structure steel having a tensile strength of 300 kg/mm^2 and being plated with a noble metal layer, each of said wires further having a contacting portion shaped to have self resiliency and being oriented such that said contacting portion may freely bend in a direction perpendicular to the axis of the contacting portion.

5,151,654

TACHOMETER SYSTEM FOR MEASURING THE RPM OF AN INTERNAL COMBUSTION ENGINE WITH NO PHYSICAL OR VISUAL CONNECTION

Stanley J. Krzywicki, Olney; Timothy S. Gibson, Columbia, and Joseph D. Orndorff, Baltimore, all of Md., assignors to Systems Control, Inc., Sunnyvale, Calif.

Filed Jul. 6, 1988, Ser. No. 215,642
Int. Cl.[5] G01P *3/42, 3/48, 3/54*
U.S. Cl. 324—160 **7 Claims**



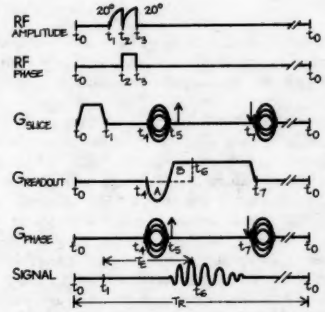
1. A tachometer system for an internal combustion engine, comprising:
electromagnetic pulse sensing means, coupled in a non-contact manner to an operative area of said internal combustion engine, for sensing an electromagnetic signal produced by a firing of said engine, and producing an output signal indicative thereof;
means for sensing a parameter indicative of pulse timing in said output signal;
means for converting said parameter into a value indicative of revolutions of said internal combustion engine per unit time; and
said sensing means comprising:
means for receiving said output signal from said electromagnetic pulse sensing means;
means for detecting a pulse in said output signal;
means for counting an elapsed time;
means for selectively enabling and disabling said counting means;
means for selectively providing an accumulated count of said counting means to an external port; and
control means, connected to said receiving means, said detecting means, said counting means, said providing means and said selecting means, for initiating a sequence upon detecting a pulse by said detecting means, by, in order: 1) disabling said counting of said counting means, 2) commanding said providing means to provide said accumulated count, 3) resetting said counting means, and finally 4) enabling said counting means.

5,151,655

MAGNETIC RESONANCE IMAGING USING A BACK-TO-BACK PULSE SEQUENCE

Steven E. Harms, Dallas; Duane P. Flamig, Richardson, and Richard H. Griffey, Dallas, all of Tex., assignors to Baylor Research Institute

Continuation-in-part of Ser. No. 484,119, Feb. 23, 1990. This application Aug. 17, 1990, Ser. No. 569,100
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **27 Claims**



1. For a three dimensional object comprised of at least two components and having an x-axis, a y-axis and a z-axis, a method of producing a selective component suppressed MR image of the internal structure of said object comprising the steps of:
generating a uniform magnetic field to magnetize said object;
generating a first, second, and third changing magnetic fields along said x-axis, y-axis, and z-axis, respectively;
generating a series of back-to-back selective component suppressive RF pulses to produce transverse magnetization in said components of said object other than said component to be suppressed;
receiving a series of gradient echoes in response to said

generated series of back-to-back selective component suppressive RF pulses; and

producing an image of said object in which said selected component is suppressed.

5,151,656

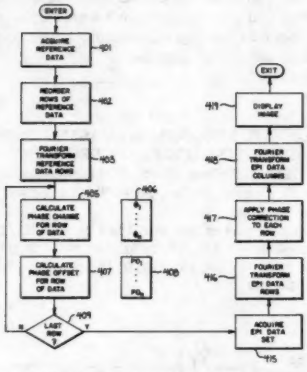
CORRECTION OF NMR DATA ACQUIRED BY AN ECHO-PLANAR TECHNIQUE

Joseph K. Maier, Milwaukee; Robert M. Vavrek, Waukesha, both of Wis., and Gary H. Glover, Menlo Park, Calif., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 11, 1990, Ser. No. 625,733

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 8 Claims



1. A method for correcting phase errors produced by an NMR system during the acquisition of an NMR image data array using an echo-planar pulse sequence, the steps comprising:

a) acquiring the NMR image data array with the NMR system using an echo-planar pulse sequence which applies a different phase encoding magnetic filed gradient for each row of acquired NMR image data in the array;

b) acquiring an array of complex NMR reference data with the NMR system using the same echo-planar pulse sequence, but with the phase encoding magnetic field gradient set to substantially zero during the acquisition of the entire array of complex NMR reference data;

c) Fourier transforming each row of the array of complex NMR reference data to produce an array of complex transformed reference data;

d) calculating a set of phase errors by determining the relative phase of data in each row of the array of complex transformed reference data;

e) Fourier transforming each row of the array of complex NMR image data to produce an array of complex transformed NMR image data;

f) correcting the complex transformed NMR image data by altering the phase of complex values therein as a function of the set of calculated phase errors;

g) Fourier transforming each column of the array of corrected, complex, transformed NMR image data to produce an array of display data; and

H) displaying the array of display data to produce an image.

5,151,657

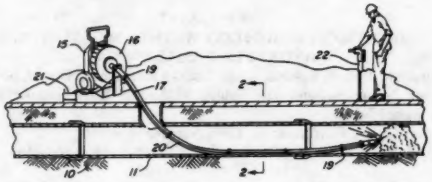
UNDERGROUND PIPE LOCATING APPARATUS

Michael D. Tashjian, 604 Bryant La., Hatboro, Pa. 19040

Continuation-in-part of Ser. No. 356,793, May 24, 1989, abandoned. This application Nov. 23, 1990, Ser. No. 617,258

Int. Cl.[5] G01V *3/30*

U.S. Cl. 324—326 5 Claims



1. In an underground locating apparatus for use with devices to be inserted into underground pipes or conduits, which devices include a head, and a member for insertion into the pipe, the improvement which comprises

a signal transmitter,

at least one antenna wire connected to said signal transmitter and to said member to cause emission of a signal along its length,

a signal detector which detects the emitted signal and provides its depth and location, and

fluid means originating above ground and directed under pressure along said member for pulling said member forward into the pipe.

5,151,658

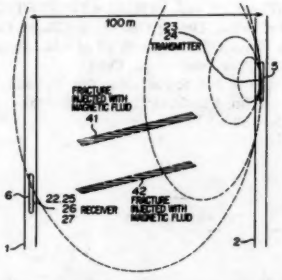
THREE-DIMENSIONAL DETECTION SYSTEM FOR DETECTING FRACTURES AND THEIR DISTRIBUTIONS IN THE EARTH CRUST UTILIZING AN ARTIFICIAL MAGNETIC FIELD AND MAGNETIC PARTICLE TRACER

Shigeki Muramatsu; Shinji Takasugi, and Kazumi Osato, all of Tokyo, Japan, assignors to Chinetsu Gijutsu Kaihatsu Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1991, Ser. No. 723,178

Int. Cl.[5] G01V *3/26, 3/40;* E21B *47/10*

U.S. Cl. 324—346 9 Claims



1. A three-dimensional detection system for detecting fractures and their distributions in the earth crust utilizing an artificial magnetic field which comprises:

a magnetic particle tracer being injected into the fractures of the earth crust, having high magnetic permeability and specific weight nearly equal to that of a fluid substance existing in the fractures; and

inner borehole magnetic field detecting devices being hung in a plurality of boreholes which are dug in the earth crust and having transmitters for transmitting said artificial

magnetic field and/or receivers for receiving said artificial magnetic field, said transmitters and receivers operating at a predetermined frequency;

wherein said magnetic field detecting devices detect distortions in terrestrial magnetic force lines caused by said fractures being filled with said injected magnetic particle tracer.

5,151,659

SURFACE POTENTIAL MEASURING SYSTEM

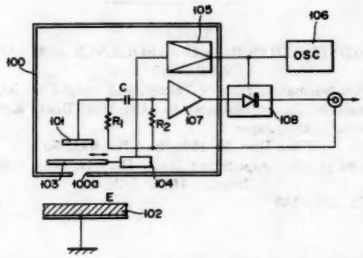
Kuniyoshi Tanaka, Yokohama; Shunji Shirouzu, Ayase; Minoru Ohta, Tokyo, and Hideo Miyagawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 27, 1990, Ser. No. 515,419

Claims priority, application Japan, Apr. 28, 1989, 1-111616; Jun. 30, 1989, 1-166985

Int. Cl.[5] G01R *29/12*

U.S. Cl. 324—458 **56 Claims**



1. A system for measuring a surface potential of a sample, comprising:

probe means, having a distal end located near a measurement surface of the sample with a gap therebetween and having a vibrating center, for probing the surface potential;

vibrating means for vibrating said probe means with respect to the vibrating center to change the gap between the distal end and the measurement surface;

detecting means for detecting a change in potential of the distal end of said probe means and converting the change into a measurement signal corresponding to the surface potential of the sample; and

means for controlling said vibrating means to maintain a constant distance between the vibrating center and the measurement surface.

5,151,660

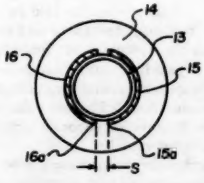
CERAMIC CAPACITANCE HIGH PRESSURE FLUID SENSOR

Kelly R. Powers, 6732 South 2485 East, Salt Lake City, Utah 84131; Tony G. Curtis, 253 East Whitlock Ave., Salt Lake City, Utah 84115; Santosh Y. Limaye, 1440 Sandpipe Cir. #38, Salt Lake City, Utah 84117, and Robert D. Roy, 715 East 4th Ave., Salt Lake City, Utah 84103

Filed Sep. 5, 1990, Ser. No. 577,862

Int. Cl.[5] G01R *27/26*

U.S. Cl. 324—689 **5 Claims**



1. An integral ceramic capacitive device for measuring changes in capacitance of a fluid flowing therethrough comprising:

a pair of opposed inner walls, said walls positioned and structured to have a fluid-containing channel therebetween, each of said walls comprising a thin layer of ceramic which is an electrical insulator and which is corrosion and erosion resistant and has a very low coefficient of thermal expansion;

an outer wall of ceramic which is an electrical insulator and which is sufficiently thick to provide structural strength for said device, said outer wall having a composition and coefficient of thermal expansion substantially similar to said inner wall;

a pair of thin, substantially continuous, electronically conductive films sandwiched between and adherent to said inner and outer walls of ceramic, said films each being of substantially the same size and shape and substantially opposed to one another and electrically isolated from one another;

said conductive films each having an electrical conductor attached thereto which extends to an external surface of said outer wall.

5,151,661

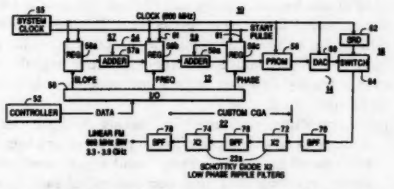
DIRECT DIGITAL FM WAVEFORM GENERATOR FOR RADAR SYSTEMS

Stephen P. Caldwell, and Thomas D. Merrell, Jr., both of Columbia, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 26, 1991, Ser. No. 749,790

Int. Cl.[5] H03B *19/00*; H03D *13/00*

U.S. Cl. 328—14 **10 Claims**



1. A linear FM waveform generator employing direct digital synthesis, said generator comprising:

clock means for generating system clock signals at a predetermined frequency;

means driven by said system clock signals for generating a linear digital FM signal;

means clocked by said clock means for converting said linear digital FM signal to a linear analog FM waveform;

sampler means clocked by said clock means for sampling said linear analog FM waveform to generate a sampler linear analog FM waveform that can be directly employed for generation of an output linear FM waveform;

means for filtering said sampler linear analog FM waveform; and

means for multiplying said filtered sampler linear analog FM waveform to generate an output linear FM waveform,

wherein said linear digital FM signal generating means includes a first register generating a constant value representing the slope of the linear FM waveform, a first integration stage having a second register and a first adder coupled to the output of said first register, said second register generating a digital output representing frequency as a function of time, a second integration stage having a third register and a second adder coupled to the output of said second register, said third register generating a digital output representing phase as a function of the square of time, and means for generating in response to the digital output from said third register a digital signal representing

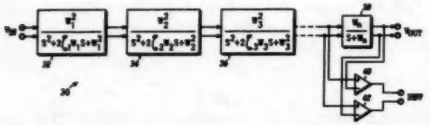
amplitude as a function of time and corresponding to said linear digital FM waveform that is coupled to said converting means for conversion to an analog waveform.

5,151,662

CIRCUIT AND METHOD OF SIGNAL DIFFERENTIATION

John E. Hanna, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 24, 1991, Ser. No. 720,069
Int. Cl.[5] H02J 7/00; G06G 7/12
U.S. Cl. 328—127 **11 Claims**



1. A circuit for differentiating a differential input signal having first and second components, comprising:

first means for filtering the differential input signal and providing a filtered differential output signal having first and second components, said first means including a first filter having an input coupled for receiving the differential input signal and having an output for providing said filtered differential output signal; and

second means for subtracting said filtered differential output signal of said first means applied at a first input from the differential input signal applied at a second input for providing a differentiated differential output signal at an output having first and second components, said second means including,

(a) a first differential amplifier having first and second inputs and an output, said first input receiving said first component of the differential input signal, said second input receiving said first component of said filtered differential output signal from said first filter, said output providing said first component of said differentiated differential output signal, and

(b) a second differential amplifier having first and second inputs and an output, said first input receiving said second component of the differential input signal, said second input receiving said second component of said filtered differential output signal from said first filter, said output providing said second component of said differentiated differential output signal.

5,151,663

PLASMA SWITCH DEVICES

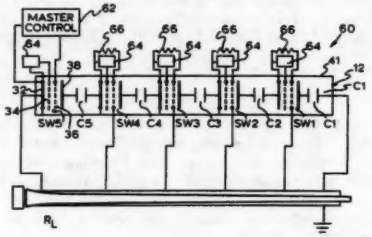
Robin J. Harvey, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 454,675, Dec. 21, 1989, Pat. No. 5,008,798.
This application Feb. 21, 1991, Ser. No. 644,781
Int. Cl.[5] H03F 21/00; H01J 7/24
U.S. Cl. 330—41 **5 Claims**

1. A current amplifier comprising:

a cold-cathode grid-controlled, crossed field plasma switch having a cathode, an anode and a control grid therebetween;

means for providing an input current between said cathode and said control grid; and



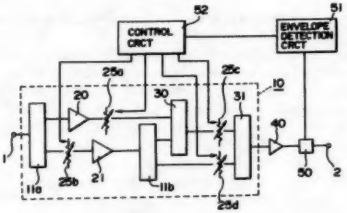
means for providing a loop for current to flow from said control grid to said anode, the current being proportional to said input current.

5,151,664

LOW-DISTORTION RADIO-FREQUENCY AMPLIFYING APPARATUS

Noriharu Suematsu; Tadashi Takagi, and Shuji Urasaki, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1990, Ser. No. 633,950
Claims priority, application Japan, Dec. 27, 1989, 1-341052
Int. Cl.[5] H03F 1/26
U.S. Cl. 330—149 **7 Claims**



1. A distortion compensating circuit for a radio frequency amplifier, comprising:

distortion compensating means coupled to an input of said radio frequency amplifier;

control circuit means responsive to a signal indicative of the distortion generated due to the non-linearity of the input and output characteristics of the radio frequency amplifier and generating at least one control signal for controlling the distortion compensating means,

said distortion compensating means further comprising: first divider means for dividing the input signal of the low-distortion radio-frequency amplifying apparatus into two output signals;

distortion generating amplifier means, coupled to said first divider means, for amplifying a first output signal of said two output signals and for adding a distortion component thereto to output an amplified first output signal;

linear amplifier means, coupled to said first divider means, receiving a second output signal of said two output signals via a first variable attenuator, for amplifying said second output signal of said two output signals without distortion to output an amplified second output signal;

second divider means coupled to said linear amplifier means, for dividing said amplified second output signal into first and second divided signals;

distortion extraction combiner means, receiving said amplified first output signal of said distortion generating amplifier means via a second variable attenuator and said first

divided signal output of said second divider means, for combining said amplified first output signal and said first divided signal in opposite phases to output a distortion signal;

combiner means, receiving said distortion signal via a third variable attenuator and said second divided signal of said second divider via a fourth variable attenuator; and

combiner means for combining said distortion signal and said second divided signal in opposite phases to output a combined signal including a distortion compensating component which cancels the distortion generated in the radio-frequency amplifier,

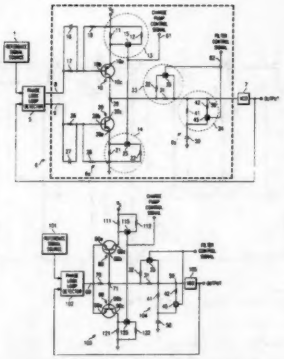
said control means adjusting an amount of attenuation of each of said variable attenuators in accordance with the said signal indicative of the distortion.

5,151,665

PHASE-LOCK-LOOP SYSTEM WITH VARIABLE BANDWIDTH AND CHARGE PUMP PARAMETERS

David D. Wentzler, North Richland Hills, Tex., assignor to Uniden America Corporation, Fort Worth, Tex.

Filed Feb. 7, 1991, Ser. No. 652,182
Int. Cl.[5] H03L *7/093*
U.S. Cl. 331—8 **13 Claims**



1. A frequency synthesizer including an input reference signal source of providing an input reference signal, a phase detector coupled to the input reference signal source for providing a phase error signal, a phase lock loop filter coupled to the phase detector for providing a steering signal, and a voltage controlled oscillator coupled to the phase lock loop filter and having an output signal coupled as a feedback signal to the phase detector, said phase lock loop filter, comprising:

a charge pump coupled to receive the phase error signal for providing a phase lock signal to a charge pump output node in response to the phase error signal, said phase lock signal being variable in response to a charge pump control signal; and

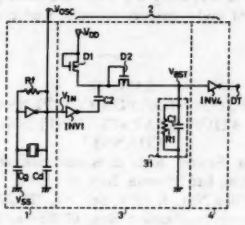
a filter coupled to the charge pump output node for filtering the phase lock signal at a given bandwidth, said bandwidth being variable in response to a filter control signal which is operated independently of the charge pump control signal.

5,151,666

OSCILLATION STOPPAGE DETECTION CIRCUIT

Akio Tamagawa, Tokyo, Japan, assignor to NEC Corpoation, Tokyo, Japan

Filed Jan. 30, 1992, Ser. No. 827,977
Claims priority, application Japan, Jan. 30, 1991, 3-9872
Int. Cl.[5] H03B *1/00*
U.S. Cl. 331—64 **8 Claims**



1. An oscillation stoppage detection circuit for use in an integrated circuit having an oscillation circuit, said detection circuit comprising:

a boost circuit which receives at its input node an output of said oscillation circuit and which includes a first diode having its anode connected to a power source terminal, a second diode having its cathode connected to an output node for outputting an output voltage of said boost circuit, a capacitor having one end connected to a common junction node between said first and second diodes, an inverter having its output terminal connected to the other end of said capacitor and its input terminal connected to said input node of said boost circuit, and a smoothing circuit connected between the output node of said boost circuit and a ground; and

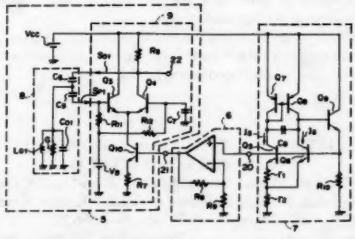
a level detection circuit which is connected to said output node of said boost circuit and which detects said output voltage of said boost circuit thereby to detect an oscillation stoppage at said oscillation circuit when said output voltage of said boost circuit becomes lower than a predetermined detection level.

5,151,667

TEMPERATURE COMPENSATED OSCILLATION CIRCUIT

Kazunori Nishijima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 17, 1991, Ser. No. 701,912
Claims priority, application Japan, May 17, 1990, 2-128055
Int. Cl.[5] H03B *5/04, 5/12;* H03L *1/02*
U.S. Cl. 331—117 R **5 Claims**



1. An oscillation circuit comprising:

an oscillator which has a differential amplifier including a constant current source having a resistor and a transistor whose emitter is grounded through said resistor, and a

feedback circuit through which an output of said differential amplifier is positively fed back to an input of the same differential amplifier;

a band-gap regulator which includes a pair of first and second transistors whose emitter areas are different from each other and which is for producing a band-gap voltage proportional to a thermal voltage of said pair of transistors; and

an operational amplifier for DC-amplifying said band-gap voltage and supplying the amplified band-gap voltage to the base of said transistor forming said constant current source.

5,151,668

FM MODULATOR FOR COMPENSATING MODULATION CHARACTERISTICS ON EACH CHANNEL

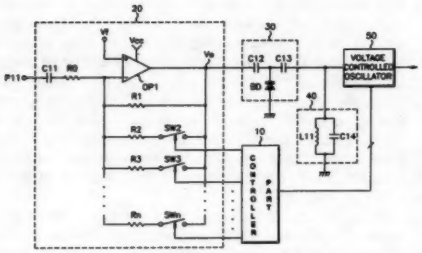
Jong-Hae Kim, Suwon, Rep. of Korea, assignor to Samsung electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 5, 1991, Ser. No. 788,290

Claims priority, application Rep. of Korea, May 23, 1991, 1991-8356

Int. Cl.[5] H03C *3/08*

U.S. Cl. 332—124 **4 Claims**



1. A frequency-modulation modulator for compensating for modulation characteristics to be suitable for each engaged channel in a cellular wireless telephone, said frequency-modulation modulator comprising:

control means for providing data to assign the channel by sensing a transmitting/receiving channel, and for generating switch control signals corresponding to said channels;

frequency compensation means for compensating for frequency characteristics of said respective channels by regulating gain of an input channel in response to said switch control signal from said control means;

a capacitance conversion means for converting into capacitance value a given voltage value from said frequency compensation means;

a resonator for generating a given resonance frequency according to said capacitance value of said capacitance conversion means; and

a voltage controlled oscillator for generating an oscillation frequency, to thereby perform the frequency modulation according to said resonance frequency.

5,151,669

DUAL-GATE FET ATTENUATOR CONTROLLED BY A VARIABLE LOAD CIRCUIT

Daniel Roques; Michel Pouysegur, and Jean-Louis Cazaux, all of Toulouse, France, assignors to Alcatel Espace, France

Filed Sep. 21, 1990, Ser. No. 586,113

Claims priority, application France, Sep. 26, 1989, 89 12587

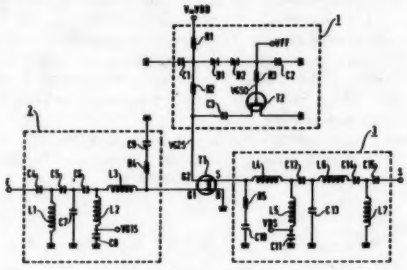
Int. Cl.[5] H03H *11/24*

U.S. Cl. 333—81 R **5 Claims**

1. A dual-gate field effect transistor (FET) attenuator, comprising:

a dual-gate FET having first and second gates and having a source and drain; and

a variable load comprising a single-gate FET having a gate, source, and drain, and a source-drain current path coupled



between the second gate of the dual gate FET and a reference potential; and

bias means coupled to said gate of said single-gate FET for applying a substantially zero drain-source bias voltage to said single-gate FET.

5,151,670

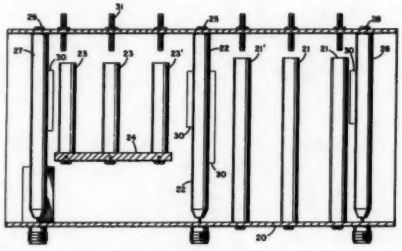
DUPLEXING FILTER

William D. Blair, Lanoka Harbor, and Salvatore Bentivenga, Manalapan, both of N.J., assignors to Radio Frequency Systems, Inc., Marlboro, N.J.

Filed Apr. 10, 1991, Ser. No. 686,325

Int. Cl.[5] H01P *1/205, 5/12*

U.S. Cl. 333—126 **7 Claims**



1. A duplexing filter comprising:

a) a housing;

b) a common coupling line electrically connected to the housing at one end of the coupling line;

c) a plurality of first resonators operating about a first predetermined frequency mounted within the housing and coupled to said common coupling line via one of said first resonators;

d) a plate mounted within the housing and electrically connected thereto;

e) a plurality of second resonators operating about a second predetermined higher frequency than the first predetermined frequency, said second resonators each having a first end mounted to the plate so that the plate forms a base upon which the resonators are mounted, wherein said plate is positioned within the housing so that one of the second resonators is electrically connected to the plate at said first end at a position from the one end of the common coupling line approximately one-quarter the wavelength of the second predetermined frequency so as to facilitate coupling of the second resonators to the common coupling line;

f) means for coupling electromagnetic energy to the plurality of first resonators; and

g) means for coupling electromagnetic energy to the plurality of second resonators.

5,151,671

CIRCUIT BREAKER

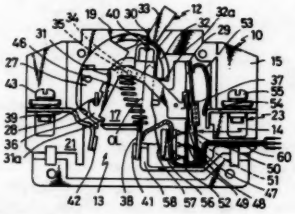
Akihiko Hirao; Tomoyuki Sawada; Shinji Takayama; Youichi Aoyama; Yukihiro Matsuoka, and Tatsuo Hiroshima, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Feb. 21, 1991, Ser. No. 658,506

Claims priority, application Japan, Feb. 23, 1990, 2-43382; Apr. 24, 1990, 2-112443; May 22, 1990, 2-133533

Int. Cl.[5] H01H *9/00*

U.S. Cl. 335—172 **11 Claims**



1. A circuit breaker comprising:

a handle having a coupling part;

a movable contact arm rotatably supported by said coupling part of said handle and having a first spring bearing part and a movable contact;

a fixed contact with respect to which said movable contact is engageable and disengageable;

a cradle having a second spring bearing part and a first locking part;

an abnormal current detecting means having a second locking part for releasably locking said first locking part of said cradle; and

a turning spring comprising a compression spring compressed between said first and second spring bearing parts for pressing said movable and fixed contacts against one another when said first locking part of said cradle is locked to said second locking part of said abnormal current detecting means and for turning to rotate said movable contact arm and cradle in a direction disengaging said movable contact from said fixed contact when said first locking part of said cradle is released from said second locking part of said abnormal current detecting means.

5,151,672

TRAP CIRCUIT COMPRISING PLURAL PIEZOELECTRIC RESONATORS INTERCONNECTED BY PLURAL RESISTORS AND AN INDUCTOR

Kazuyuki Noto, Kurobe, and Isao Toyoshima, Ishikawa, both of Japan, assignors to Murata Manufacturing Co., Nagaokakyo, Japan

Filed Dec. 13, 1990, Ser. No. 627,025

Claims priority, application Japan, Dec. 14, 1989, 1-325383

Int. Cl.[5] H03H *9/58*

U.S. Cl. 333—189 **3 Claims**

1. A trap circuit for eliminating unwanted signals with specific frequencies from an incoming signal, said trap circuit comprising:

an input end through which said incoming signal is received;

an output end;

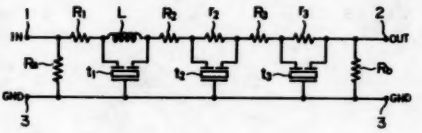
a plurality of three-terminal piezoelectric ceramic resonators each having an input terminal, an output terminal and a grounded common terminal, each of said resonators having a different resonance frequency, the input and output terminals of said resonators being coupled in cascade between said input and output ends;

an input-end parallel resistor connecting said input end with said grounded common terminals;

an input-end series resistor connecting said input end with the input terminal of one of said resonators;

an output-end parallel resistor connecting said output end with said grounded common terminals;

one or more inter-resonator resistors;



one or more inter-terminal resistors; and

an inductor;

one of said plurality of resonators having a lowest resonance frequency and having said inductor connected between its input and output terminals, the rest of said resonators each having one of said inter-terminal resistors connected between its input and output terminals, the input and output terminals of each mutually adjacent pair of said resonators being connected by one of said inter-resonator resistors.

5,151,673

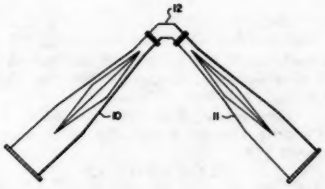
COMPACT BEND FOR TE_{01} MODE CIRCULAR OVERMODED WAVEGUIDE

Jeffery W. Waarren, Ellicott City, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Jul. 29, 1991, Ser. No. 736,846

Int. Cl.[5] H01P *1/02*

U.S. Cl. 333—249 **5 Claims**



1. A compact bend structure for use with TE_{01} mode circular overmoded waveguide, comprising:

first and second waveguide transition sections, each configured as a circular waveguide at one end for circular TE_{01} mode operation and transitioning into a single rectangular waveguide for rectangular TE_{20} mode operation at its other end, and

a TE_{20} mode rectangular waveguide bend section connecting the said other ends of said first and second waveguide transition sections together at a desired angle relative to one another.

5,151,674
POWER CIRCUIT BREAKER

Peter Flohr, Messkirch, Fed. Rep. of Germany, assignor to Heinrich Kopp GmbH & Co. KG, Kahl, Fed. Rep. of Germany

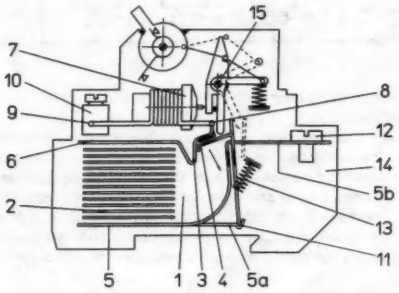
PCT No. PCT/DE90/00316, § 371 Date Mar. 8, 1991, § 102(e) Date Mar. 8, 1991, PCT Pub. No. WO90/13903, PCT Pub. Date Nov. 15, 1990

PCT Filed May 2, 1990, Ser. No. 646,771

Claims priority, application Fed. Rep. of Germany, May 9, 1989, 3915127

Int. Cl.[5] H01H *75/00*

U.S. Cl. 335—16 **20 Claims**



1. A power circuit breaker with one single interruption and electromagnetic, electrothermal and manual trip with contact arrangement disposed in the front of an arc-extinguishing plate stack in an arc chamber, wherein a first and a second arc deflector, delimiting the arc-extinguishing plate stack, as in each case galvanically connected to a connection terminal, and wherein the first arc deflector is formed as a fixed contact, and wherein the second arc deflector serves as a bearing position for a movable contact and is galvanically connected to the movable contact, wherein the movable contact (4) is canted and angled at its free end up to a contacting position such that this free end, together with the first arc deflector (6), used as a fixed contact (3), runs nearly parallel, and wherein the angled free end of the movable contact forms the tangent to a circle, and wherein the center of this circle is disposed in the neighborhood of the bearing position (11) of the movable contact (4), such that the current forces, occurring in the parallel arms increase the pressure at the bearing position as well as effect a torque in opening direction onto the movable contact.

5,151,675
ELECTROMAGNETIC RELAY WITH A CONTACT SPRING MOUNTED ON AN ARMATURE

Wilfried Biehl, and Bernhard Kleine-Onnibrink, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 20, 1991, Ser. No. 718,247

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1990, 901540[U]

Int. Cl.[5] H01H *51/22*

U.S. Cl. 335—78 **6 Claims**

1. An electromagnetic relay, comprising:

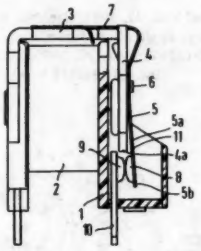
a coil;

stationary contacts mounted in said relay;

an armature mounted for movement at an end of said coil about a pivot edge, said armature having a free edge;

a contact spring of leaf spring material secured to said armature to bias said armature toward a predetermined position, said contact spring having a contact end extending beyond said free edge of said armature, said contact spring being of a reduced width in a region adjacent said free edge of said armature and having a broadened portion extending beyond said free edge to form two transverse legs;

two contact pieces mounted on respective ones of said transverse legs, said contact pieces being movable into contact with said stationary contacts to define a closed position and alternately out of contact with said stationary contacts to define an open position upon movement of said armature by alternate application and discontinuation of electromagnetic forces by said coil; and



supporting tabs on respective ones of said transverse legs of said contact spring, said supporting tabs extending from said transverse legs for contact with said armature in a region adjacent said free edge upon movement of said armature in a direction to move said contact pieces from said closed position to said open position, said supporting tabs comprising edge sections of said contact spring which are bent toward said armature.

5,151,676
FILM RESISTANCE TERMINATOR

Shouichi Sato, Tagajo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

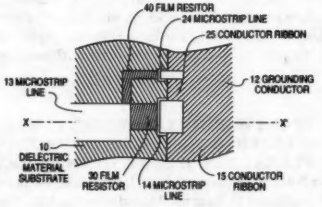
PCT No. PCT/JP90/00080, § 371 Date Oct. 2, 1990, § 102(e) Date Oct. 2, 1990, PCT Pub. No. WO90/09040, PCT Pub. Date Aug. 9, 1990

PCT Filed Jan. 24, 1990, Ser. No. 582,210

Claims priority, application Japan, Feb. 2, 1989, 1-24626; Sep. 19, 1989, 1-242647

Int. Cl.[5] H01C *3/02*

U.S. Cl. 338—61 **8 Claims**



1. A film resistance terminator utilizing film resistors, comprising:

a dielectric material substrate;

a grounding conductor;

a first microstrip line formed on said dielectric material substrate to propagate an input signal;

a first film resistor having an inductive reactance and having a first end connected to an end part of said first microstrip line and a second end connected to said grounding conductor; and

a second film resistor electrically connected in parallel with said first film resistor, and having a capacitive reactance, a combined reactance of said first and second film resistors

is lower than the inductive reactance of said first film resistor.

5,151,677

RAPID ORIENTATION APPARATUS FOR AN OBSERVATION AND/OR WEAPON-CARRYING VEHICLE

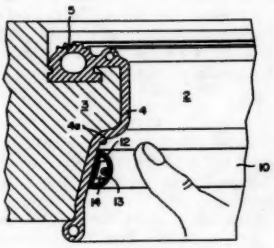
Pierre Gernet, Ennetbaden; Werner Steinemann, Rumlang, and Paul-Andre Margot, Zurich, all of Switzerland, assignors to Oerlikon-Contraves AG, Zurich, Switzerland

Filed Feb. 4, 1991, Ser. No. 650,286

Claims priority, application Switzerland, Feb. 9, 1990, 00424/90

Int. Cl.[5] H01C *10/10*

U.S. Cl. 338—99 **17 Claims**



1. A rapid orientation apparatus for an observation and/or weapon-carrying vehicle provided with an observer's post and an observation hatch, comprising:

electric circuit means serving as an angle transmitter;

said electric circuit means containing a contact potentiometer;

said observation hatch defining a rim portion, said contact potentiometer being substantially annularly arranged around the observer's post and extending along said rim portion;

said contact potentiometer comprising:

(i) a arcuate, hose-like insulating envelope defining a radial direction;

(ii) a resistance track;

(iii) a contact track; and

said resistance track and said contact track being disposed within said arcuate, hose-like insulating envelope at a predeterminate spacing from each other as viewed in said radial direction.

5,151,678

SAFETY BELT

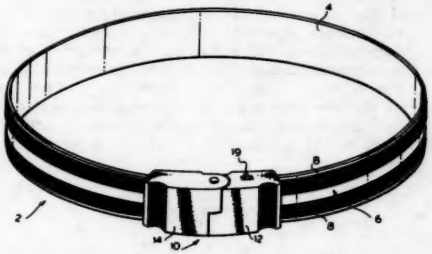
Jeffrey A. Veltri, and Joseph M. Souliere, both of P.O. Box 910, Thornhill, Ontario, Canada L3P 4A5

Filed May 4, 1990, Ser. No. 519,127

Int. Cl.[5] G08B *23/00*

U.S. Cl. 340—321 **9 Claims**

1. A safety belt comprising a flexible support member forming the body of the belt, a continuous electroluminescent flexible strip extending substantially the length of the belt and exposed to one side of the belt, power supply means connected to said electroluminescent flexible strip for exciting the same, and means for securing said belt at various positions wherein said flexible support member has a slotted area in the outer face thereof sized to receive and engage said electroluminescent strip in a manner to expose a light producing portion of said strip within the opening of said slot.



5,151,679

DISPLAY SIGN

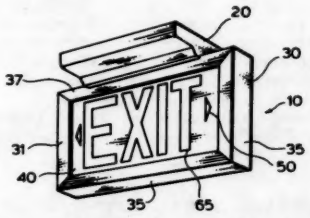
Frederick Dimmick, R.R. No. 3, Parry Sound, Ontario, P2A 2W9, Canada, assignor to Frederick Dimmick, Parry Sound, Canada

Continuation of Ser. No. 271,296, Nov. 15, 1988, abandoned. This application Feb. 7, 1992, Ser. No. 831,661

Claims priority, application Canada, Mar. 31, 1988, 563009

Int. Cl.[5] G08B *27/00*; G09F *19/12*

U.S. Cl. 340—326 **56 Claims**



9. For use as a light source in a sign a light pipe having at least two ends of a suitable material of substantially uniform index of refraction, having a longitudinal axis of extension, and carrying at least one light source being a light emitting diode proximate at least one end wherein the at least one light source is contained in said at least one end, said light source directed towards another end of the light pipe in the direction of the longitudinal axis of extension of the light pipe, a portion of the outer surface of the light pipe being translucent permitting light to exit therefrom, whereby when light is transmitted in the light pipe, the light therefrom emerges through the translucent outer surface of the light pipe.

5,151,680

SPEAKER DRIVER

Koji Yamasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 414,644, Sep. 27, 1989, abandoned, which is a continuation of Ser. No. 150,618, Feb. 1, 1988, abandoned. This application Apr. 26, 1991, Ser. No. 692,771

Claims priority, application Japan, Feb. 5, 1987, 62-25210

Int. Cl.[5] H04B *1/16*

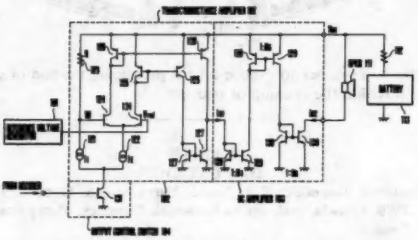
U.S. Cl. 340—384 E **19 Claims**

1. A speaker driver, operated by a battery, for driving a speaker to generate an alert tone in response to an externally output intermittent signal, said driver comprising:

a reference voltage generator for generating a reference voltage;

a transconductance amplifier for outputting a current corresponding to a differential voltage between a voltage of said battery and the reference voltage;

said transconductance amplifier comprising a series circuit of a resistor connected between said battery and said output control switch and a first constant current source, a differential transistor pair, bases of transistors of which are respectively connected to an output of said reference voltage generator and a point between said resistor and said first constant current source, emitters of both said transistors being connected to said output control switch



through a second constant current source, first and second current mirrors, one transistor of each of which is connected between each transistor of said differential transistor pair and said battery, and a third current mirror consisting of transistors, each of which is series-connected to the other transistor of each of said first and second current mirrors between said battery and ground; and an output from said transconductance amplifier being obtained at a point between said second and third current mirrors;

an output control switch for ON/OFF-controlling the output current from said transconductance amplifier in accordance with the intermittent signal; and

a DC amplifier for amplifying the ON/OFF-controlled output current as a driving current for said speaker.

5,151,681

BRAKE WEAR INDICATING DEVICE

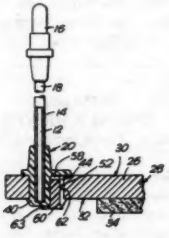
Francis Valmir, Argenteuil; Yves Mazon, Paris, and Eric Schonenberger, Bois Colombes, all of France, assignors to General Motors France, Gennevilliers, France

Continuation of Ser. No. 549,305, Jul. 9, 1990, abandoned. This application Oct. 8, 1991, Ser. No. 772,633

Claims priority, application United Kingdom, Aug. 25, 1989, 8919343

Int. Cl.[5] B60T *17/22*

U.S. Cl. 340—454 **11 Claims**



1. A brake wear indicating device comprising an insulated electrical conductor; connecting means electrically connected to one end of the electrical conductor for electrical connection with a warning device; and an end cap of electrically insulating material on the other end of the electrical conductor for securing the brake wear indicating device in an aperture in a backing plate of a brake pad or brake shoe with said other end of the electrical conductor passing through the aperture in the backing plate from an outer surface thereof to protrude from an inner surface thereof, and the end cap allowing the indicating device to be removed and later be resecured in the aperture of the backing plate, the end cap comprising an abutment edge for engaging the outer surface of the backing plate adjacent the periphery of the aperture, a cap portion secured to said other end of the electrical conductor and having a shoulder for engaging the inner surface of the backing plate adjacent the periphery of the aperture, the cap portion mounting the electrical conductor eccentrically within the aperture, and at least a first resiliently flexible finger positionable in and extensible through the aperture, and the finger within the aperture being separated from the cap portion within the aperture by a spacial gap between the finger and the cap portion, and the finger having a lip for making a latch engagement with the inner surface of the backing plate adjacent the periphery of the aperture and the brake wear indicating device including a plug member separated from the electrical conductor, the plug member being insertable in the spacial gap between the cap portion of the end cap and the at least one finger, the plug member having a rib for connection with a groove in the cap portion of the end cap.

5,151,682

FAIL-SAFE TESTING OF AN INFRARED SENSOR ARRANGEMENT

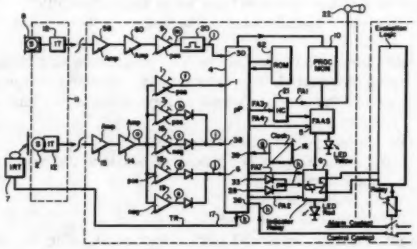
Waldemar Marinitsch, Putzbrunner Str. 43, 8 Munich 83, Fed. Rep. of Germany

Filed Jun. 10, 1991, Ser. No. 711,534

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1990, 4020175

Int. Cl.[5] G08B *29/00*

U.S. Cl. 340—514 **24 Claims**



1. A system for fail-safe testing of an infrared sensor arrangement including at least a first infrared sensor having an output, an amplifying circuit connected to an output of the infrared sensor to produce an amplified infrared sensor output signal having a signal level, comprising:

a signal processing circuit connected to the amplifier and responding to the amplified infrared sensor output signal to transmit an output alarm signal to a condition indicating device to trigger a condition indication;

first comparator means, connected to the amplifying circuit, for receiving the amplified infrared sensor output signal and comparing the signal level with at least one first determined threshold value corresponding to a signal level produced when substantially no infrared activity is detected by the infrared sensor, to produce a pulse signal for transmission to the signal processing circuit whenever the amplified sensor output signal level exceeds said first threshold value;

second comparator means, for receiving the amplified infrared sensor output signal and comparing the signal level with at least one second determined threshold value, to

produce a pulse signal for transmission to the signal processing circuit when infrared activity is detected; and

infrared signal transmitting means periodically actuated by the signal processing circuit for transmitting an infrared test pulse of defined level and duration detectable by the infrared sensor, and which produces a signal level of the amplified infrared sensor output signal which is above said first determined threshold value and below at least one said second determined threshold value;

wherein the signal processing circuit monitors the interval between successive pulse signals produced by the first comparator means and triggers a condition indication when no signals are produced by the first comparator means within a predetermined first time period; wherein the signal processing circuit, after triggering the infrared signal transmitting means, monitors said second comparator means for indications that said test pulse has been received during a predetermined second time period, and triggers a condition indication when no signals indicative of reception of the test pulse are produced by the second comparator means during the second time period; and wherein, during the second predetermined time period, the signal processing circuit prevents processing of any response to the test pulse by the first comparator.

5,151,683

POWER SUPPLY CONTROL DEVICE IN FIRE ALARM SYSTEM

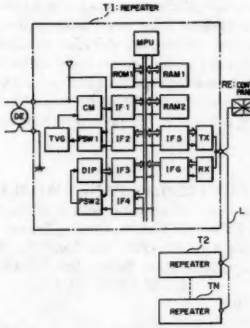
Kaoru Takahashi; Akio Tsumuji, and Ryuji Shutoku, all of Tokyo, Japan, assignors to Nohmi Bosai Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1990, Ser. No. 468,865

Claims priority, application Japan, Jan. 31, 1989, 1-20988; Jan. 31, 1989, 1-20989

Int. Cl.[5] G08B *26/00*

U.S. Cl. 340—518 **4 Claims**



1. In a fire alarm system terminal, an apparatus comprising:

a comparator for receiving a detection signal from a fire detection apparatus and for discriminating a fire phenomenon by comparing the detection signal with a reference voltage during a detection period in which the fire alarm system terminal is activated to detect the fire phenomenon;

a reference voltage supply means for selectively generating and outputting the reference voltage to said comparator; and,

a power supply control means for causing said reference voltage supply means to generate and output the reference voltage to said comparator only during said detection period.

5,151,684

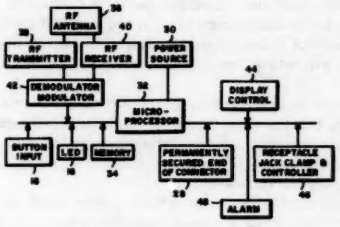
ELECTRONIC INVENTORY LABEL AND SECURITY APPARATUS

Edward L. Johnsen, 19 Bent Ave., Wayland, Mass. 01778

Filed Apr. 12, 1991, Ser. No. 684,574

Int. Cl.[5] G08B *13/14*

U.S. Cl. 340—572 **35 Claims**



18. A security and tracking device comprising:

a tag device;

communication means on said tag device for transmitting and receiving wireless communications;

processor means coupled to said communication means;

means for attaching said tag device to a piece of merchandise;

means, coupled to said processor means, for detecting detachment of said tag device from said piece of merchandise; and

means, coupled to said processor means, for releasing said attaching means, wherein said processor means operates said releasing means in response to a signal received by said communication means, said signal indicating that said piece of merchandise has been purchased.

5,151,685

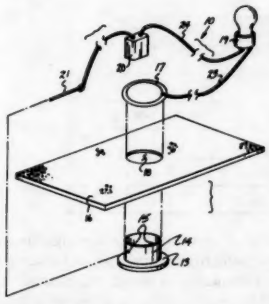
WATER LEVEL ALARM APPARATUS

William W. Spicer, 13050 Forts Lake Rd., Grand Bay, Ala. 36541, and Warren R. Spicer, 4565 Grand Bay Wilmer Rd., Mobile, Ala. 36695

Filed Mar. 12, 1991, Ser. No. 668,234

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—605 **1 Claim**



1. A water level alarm apparatus comprising, in combination,

a floor, and

a collar positioned on the floor, and

a support tube defined by a predetermined external diameter, and

the collar fixedly mounted to a lower terminal end of the support tube orthogonally oriented relative to an axis defined by the support tube, and

expandable means mounted on the collar for expansion from a first dehydrated thickness to a second moistened thickness, and

switch means for actuating a signal member, wherein the switch means includes a first member mounted to the expandable means and a second member mounted to the support tube, whereupon the first member and the second member are in separated orientation relative to one another when the expandable means is defined by the first thickness, and wherein the first and second members are in electrical communication relative to one another when the expandable means is defined by the second thickness, and

a battery mounted within the support tube, wherein the first member, the second member, and the signal member are all in electrical communication through the switch means and the battery when the expandable means is defined by the second thickness, and

the expandable means includes a sponge sheet, the sponge sheet including a central bore defined by the predetermined external diameter mounted upon a top surface of the collar, and the first member includes a torroidal electrically conductive ring fixedly mounted on the sponge sheet about the central bore of the sponge sheet in sliding communication with the support tube, wherein the ring is defined by an internal diameter substantially equal to the predetermined external diameter of the support tube, and

the second member includes an electrically conductive pin, and the support tube includes a plurality of diametrically aligned openings orthogonally oriented relative to the axis of the support tube above the top surface of the collar wherein the second means is mounted.

5,151,686

ELECTRONIC BRUSH GENERATION

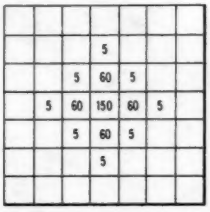
Stephen Freeman, Bedfordshire, England, assignor to Crosfield Electronics Limited, England

Filed Feb. 5, 1991, Ser. No. 650,541

Claims priority, application United Kingdom, Feb. 5, 1990, 9002475

Int. Cl.[5] G09G *1/28*

U.S. Cl. 340—703 **6 Claims**



1. A method of generating and storing a representation of the profile of an electronic brush for use subsequently to create or modify electronically an image, the method comprising the steps of electronically moving a previously defined brush to create an array of pixels having a shape corresponding to a new brush profile, wherein the previously defined brush profile comprises an array of pixels for each of which a value is stored, and wherein a value is stored for each pixel of the new array of the new brush profile computed in accordance with a predetermined algorithm from the values of the or each pixel of the previously defined brush profile which passes through the new array pixel during movement of the previously defined brush.

5,151,687

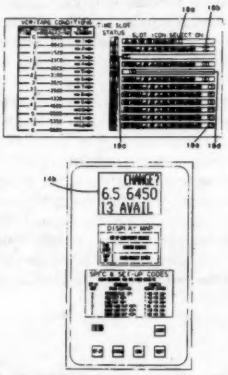
APPARATUS FOR LOGGING ELECTRONIC MEDIA-TAPED MATERIAL

George G. Younger, 10553 Farallone Dr., Cupertino, Calif. 95014

Filed Jul. 16, 1990, Ser. No. 554,138

Int. Cl.[5] G09G *5/00*

U.S. Cl. 340—706 **16 Claims**



1. An apparatus for logging descriptive information, such as subject, duration, location, and tape status, pertaining to material recorded by a cassette-type electronic media tape recorder, comprising a case; a panel face, characterized by showing the read-out locations of individual elements of said descriptive information for specified combinations of said tape recorder designs, tape speed settings of said tape recorder, and cassette tape types; a display means, in combination with said panel face read-out locations, characterized by display of descriptive indications of states of fractional-hour time slots on said cassette tape and subjects of said material residing in said time slots, indexed numerical designations for said time slots on said cassette tape, duration of discrete recordings of said material in said time slots, cumulative time durations and, depending on the specified recorder design, numerical counter readings from beginning of said cassette tape installed in said tape recorder, and a data input means, whereby an operator logs said descriptive information relative to the recorded material.

5,151,688

INPUT/OUTPUT DISPLAY PANEL WITH LIGHT PEN

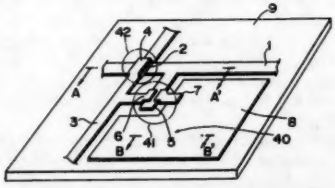
Masaru Tanaka, and Yutaka Ishii, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 16, 1990, Ser. No. 509,178

Claims priority, application Japan, Apr. 19, 1989, 1-99618

Int. Cl.[5] G09G *3/02*

U.S. Cl. 340—707 **7 Claims**



1. An information input and output apparatus comprising:

display means for displaying an image according to an image signal, said display means having plural pixel electrodes formed in a matrix shape on transparent substrate;

plural row electrode lines being formed on said transparent substrate so as to be parallel to each other;

plural column electrode lines being formed on said transparent substrate, parallel to each other, so as to cross said row electrode lines with an intersecting angle of substantially right angles;

switching means for driving said display means responsive to a predetermined voltage to be applied to one of the row electrode lines and a predetermined voltage to be applied as said image signal to one of the column electrode lines;

a light pen for projecting light onto said display means;

a photoconductive layer, having a predetermined length and width, being formed only between each of said row electrode lines and each of said column electrode lines at each intersection of said row electrode lines and said column electrode lines, the electrode line located above said photoconductive layer being of a lesser width than the width of the photoconductive layer, so that the photoconductive layer can effectively receive light projected from said light pen; and

detecting means for detecting a position of said light pen located on said display means to a signal induced to each of said column electrode lines.

5,151,689

DISPLAY DEVICE WITH MATRIX-ARRANGED PIXELS HAVING REDUCED NUMBER OF VERTICAL SIGNAL LINES

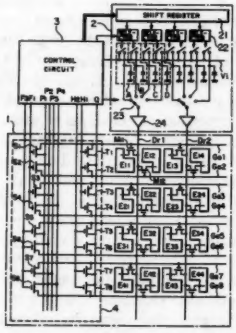
Nobuaki Kabuto; Mayumi Igarashi; Fumio Inoue, and Kunio Ando, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 21, 1989, Ser. No. 341,789

Claims priority, application Japan, Apr. 25, 1988, 63-100304

Int. Cl.[5] G01G *3/36*

U.S. Cl. 340—784 **15 Claims**



1. A display device comprising a display panel including a plurality of signal lines extending in a vertical direction, a plurality of scanning lines extending in a horizontal direction, and display elements disposed as pixels at respective intersections of a matrix formed by said signal lines and said scanning lines, said signal lines, said scanning lines and said display elements being disposed on a substrate, in which the total number of the display elements as pixels arranged in the horizontal direction is larger than the total number of said signal lines, and the total number of the display elements as pixels arranged in the vertical direction is smaller than the total number of said scanning lines, wherein each of said signal lines is disposed between pixel electrodes to drive adjacent display elements as pixels, each of said signal lines is operatively connected to at least two pixels adjacent to each other in the horizontal direction, and the two adjacent pixels in the horizontal direction are operatively connected to different scanning lines, respectively, whereby each of the two adjacent pixels in the horizontal direction is driven by a different combination of said signal lines and a different respective one of said different scanning lines.

5,151,690

METHOD AND APPARATUS FOR DRIVING A LIQUID CRYSTAL DISPLAY PANEL

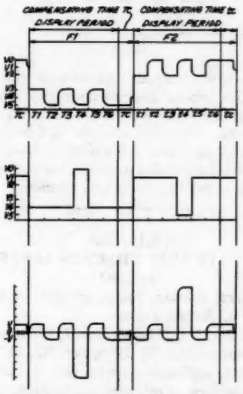
Katsunori Yamazaki, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 232,750, Aug. 18, 1988, Pat. No. 5,010,326. This application Jan. 16, 1991, Ser. No. 642,107

Claims priority, application Japan, Jan. 16, 1990, 2-6677

Int. Cl.[5] G09G *3/36*

U.S. Cl. 340—784 **19 Claims**



1. A method of driving a liquid crystal panel to produce a display pattern at display elements of a panel having a plurality of scanning electrodes on one of a pair of substrates between which a liquid crystal layer is interposed and a plurality of signal electrodes on the other substrate, a display element being defined at the intersection of a scanning electrode and a signal electrode, comprising the steps of:

providing, during the operation of said panel, periods of time during which said panel is driven to produce a display pattern (the driving times), and periods of time during which said panel is compensated at least in part for display unevenness during a preceding display time due to the display pattern (the compensation times);

applying a scanning driving waveform including at least a selective and a non-selective voltage to at least one end of each scanning electrode during said driving times;

applying a data driving waveform including at least a non-lighting and a lighting voltage to at least one end of each signal electrode during said driving times; and

during said compensating times, not applying the selective voltage to any of the plurality of scanning electrodes and applying a compensating waveform as required to one or more of the signal electrodes of the liquid crystal panel for compensating at least in part for display unevenness during a preceding display time due to the display pattern.

5,151,691

ACTIVE DISPLAY DEVICE

Karel E. Kuijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 30, 1990, Ser. No. 606,013

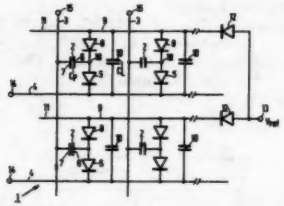
Claims priority, application Netherlands, Nov. 27, 1989, 8902922

Int. Cl.[5] G09G *3/36*

U.S. Cl. 340—784 **23 Claims**

1. A display device comprising: an electro-optical display

medium between two supporting plates, a system of pixels arranged in rows and columns, with each pixel being defined by two picture electrodes arranged on the facing surfaces of the supporting plates, a system of row and column electrodes for driving the pixels, at least one first asymmetrical non-linear switching element connected in series with each pixel between



the pixel and a row electrode, wherein, at the location of a pixel, at least one second asymmetrical non-linear switching element is connected in series arrangement with the first asymmetrical non-linear switching element and between the pixel and a node and, at the location of a pixel, at least one capacitive element is connected parallel to the series arrangement of the first and second non-linear switching elements.

5,151,692

BOARDING GATE SEAT CHECKIN APPARATUS AND METHOD

Kazuaki Hirahara, Ibaraki, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

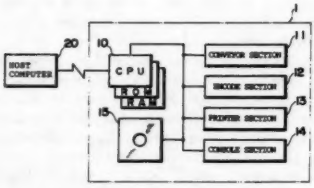
Continuation of Ser. No. 281,024, Dec. 7, 1988, abandoned. This application Apr. 30, 1990, Ser. No. 517,483

Claims priority, application Japan, Dec. 11, 1987, 62-314783

The portion of the term of this patent subsequent to Jan. 8, 2008, has been disclaimed.

Int. Cl.[5] H04B *1/00*

U.S. Cl. 340—825.28 **7 Claims**



1. A checkin apparatus comprising:

(a) a checkin gate disposed near a boarding gate for a passenger transport means, said checkin gate comprising:

(b) a seat table for said passenger transport means for storing data representative of the presence or absence of unoccupied seats;

(c) checking means for checking whether a current time is within a predetermined time period before departure of said passenger transport means;

(d) unoccupied seat deleting means, connected to said seat table and to said checking means, operative when said current time is before said predetermined time period, for receiving boarding cards on which a seat is assigned, checking the validity of said boarding cards, storing occupied data in said seat table with respect to seats read from boarding cards determined to be valid, and releasing a received boarding card;

(e) unoccupied seat assignment means, connected to said seat table and to said checking means operative when said current time reaches said predetermined time period, for receiving tickets on which a seat is not assigned, assigning a seat which is not yet occupied to said ticket with reference to said seat table, updating said seat table to identify the assigned seat as occupied, and discharging a boarding card containing data identifying said assigned seat; and

(f) means connected to said seat table and to said checking means, for determining, after said current time reaches said predetermined time period, whether all seats have been occupied with reference to said seat table.

5,151,693

WIRELESS SIGNAL TRANSMISSION SYSTEM WITH RANDOM ACCESS

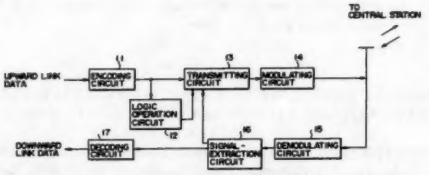
Seizo Onoe, and Narumi Umeda, both of Yokohoma, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Sep. 18, 1990, Ser. No. 584,264

Claims priority, application Japan, Sep. 19, 1989, 1-240822

Int. Cl.[5] H04B *7/00*

U.S. Cl. 340—825.3 **4 Claims**



1. A digital wireless communication method is which data is transmitted and received by a central station and each of a plurality of terminal stations, said terminal stations being capable of randomly accessing said central station, the method comprising the steps of:

transmitting from said central station a first indication signal for indicating when said terminal stations are enabled to transmit an original data signal to said central station;

transmitting at least a portion of the original data signal from at least one of said terminal stations to said central station when the first indication signal received from said central station indicates that transmission is enabled;

generating another indication signal in said central station, said another indication signal including data generated in accordance with a predetermined rule, based on the at least a portion of the original data signal received from said at least one terminal station, said another indication signal further including at least one of a partial data of the at least a portion of the original data signal and a partially processed data of the at least a portion of the original data signal, said another indication signal further including proper receipt data indicating whether the at least a portion of the original data signal was correctly received by said central station and enabling data for enabling said at least one terminal station to transmit a remaining portion of the original data signal;

transmitting said another indication signal from said central station to said at least one terminal station;

then comparing at said at least one terminal station, data in the received another indication signal with data stored in said at least one terminal station;

determining in said at least one terminal station; using the at least one of the partial data and the partially processed data of the at least a portion of the original data signal and the proper receipt data in said another indication signal, whether said central station correctly received the at least a portion of the original data signal previously transmitted from said at least one terminal station; and

suspending transmission of data signals from said at least one terminal station for a predetermined period of time as soon as the determining step determines that the at least a portion of the original data signal transmitted from said at

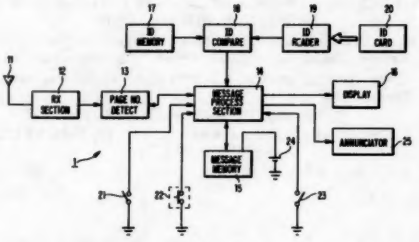
least one terminal station was not correctly received by said central station.

5,151,694

PAGING RECEIVER CAPABLE OF PREVENTING UNAUTHORIZED ACCESS TO MESSAGE MEANT THEREFOR

Koji Yamasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 30, 1989, Ser. No. 374,020
Claims priority, application United Kingdom, Jun. 30, 1988, 63-164340
Int. Cl.[5] H04Q 7/00
U.S. Cl. 340—825.44 26 Claims



1. A paging receiver comprising:
first storing means for storing a paging number;
means for receiving a paging number followed by a message;
first comparing means for comparing the stored paging number and received paging number and producing a coincidence signal when they are identical;
means responsive to said coincidence signal for receiving said message;
means for displaying the received message;
second storing means for storing a first identification number;
third storing means for storing a second identification number;
means for reading said second identification number out of said third storing means;
means for comparing said first identification number and the read-out second identification number; and
means for preventing said displaying means from displaying said message if said first and second identification numbers are not identical.

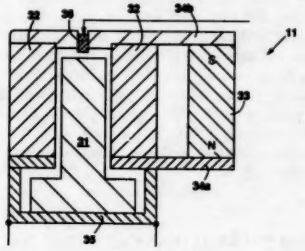
5,151,695

TELEMETRIC MEASURING DEVICE WITH HIGH POWER GENERATION

William L. Rollwitz; Armando De Los Santos; William D. Perry; Robert W. Burrahm, and James K. Davis, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Oct. 2, 1990, Ser. No. 591,952
Int. Cl.[5] G08C 19/06; H02K 11/00
U.S. Cl. 340—870.33 21 Claims

1. A power generator for a telemetric measuring device for measuring physical conditions of machinery having a moving part, comprising:
a magnet for energizing a magnetic circuit, said magnet being fixed with respect to said moving part;
a coil for providing induced electrical current, said coil being fixed with respect to said moving part; and
a reciprocator slug, made from a magnetically conductive material, placed inside said coil and moveable with respect to said magnet and said coil, such that said slug is free to move in response to inertial forces provided by said moving part, thereby opening and closing said magnetic circuit and inducing an electrical current in said coil.

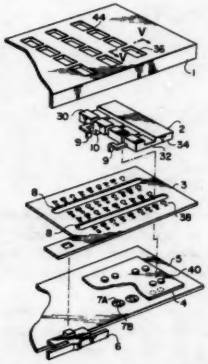


5,151,696

MULTI-FUNCTION KEYBOARD FOR REMOTE CONTROL APPARATUS

Yasuhiro Kasahara; Hiroshi Suzuki; Yasuhiro Yakushiji, all of Yokohama; Shoichi Ito, Hamamatsu, and Takashi Suzuka, Osaka, all of Japan, assignors to Hitachi, Ltd., Tokyo and Sanwa Electronics Instrument Co., Ltd., Higashiosaka, both of, Japan

Filed Mar. 28, 1990, Ser. No. 500,504
Claims priority, application Japan, Mar. 29, 1989, 1-075154
Int. Cl.[5] H03M 11/04; H04B 1/034
U.S. Cl. 341—22 6 Claims



1. A button switch apparatus, comprising:
a case formed with a plurality of windows;
a button array including a plurality of operating buttons adapted to said windows, respectively, each of said operating buttons having a transparent part;
a switch array including a plurality of switches associated with said buttons, respectively;
a mark sheet disposed between said button array and said switch array and having sets of marks recorded thereon, respective sets indicating respective sets of operating functions of said operating buttons such that at least two marks are recorded for each of said operating buttons, said marks being selectively viewable through the transparent parts of said operating buttons by movement of said mark sheet;
mode selecting means for selecting one of a plurality of predetermined modes, each mode determining a specific set of operating functions of said operating buttons, by

moving said mark sheet so that the marks indicating the respective set of operating functions of said operating buttons in a selected mode are viewed through the transparent parts of said operating buttons; and

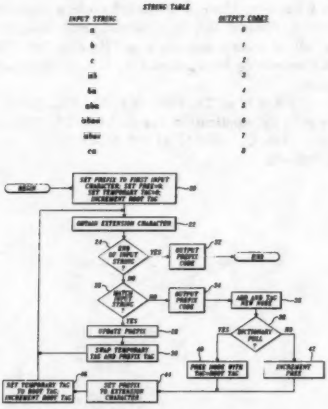
means for allowing each of said operating buttons to be operated with no contact with said mark sheet, including at least one elongated slit formed in a offset manner in said mark sheet so as not to overlap with the transparent parts of said operating buttons and through which slit, a plurality of said operating buttons are capable of actuating the associated switch with no contact with the mark sheet when the operating button is operated as said mark sheet is moved.

5,151,697

DATA STRUCTURE MANAGEMENT TAGGING SYSTEM

Suzanne Bunton, Seattle, Wash., assignor to Board of Regents of the University of Washington, Seattle, Wash.

Filed Oct. 15, 1990, Ser. No. 598,418
Int. Cl.[5] H03M *7/30*
U.S. Cl. 341—51 **19 Claims**



1. An adaptive data compression and decompression method for compressing an input string of character signals over an alphabet Σ into a string of output code signals while maintaining a data dictionary of size D, the method comprising the steps of:

establishing an encoding dictionary in memory comprised of stored string entries, wherein each stored string entry in said encoding dictionary represents a string of character signals encountered in said input string of character signals and each stored string entry is related to a unique output code signal, and wherein each stored string entry of length greater than one character is related to a unique string entry tag,

maintaining an encoding master tag as an index to said string entry tags;

searching said input string of character signals by comparing said string to said stored string entries to determine a longest match;

outputting an output code signal related to said longest match;

adding an extended string entry related to said longest match followed by the next sequential unmatched character signal from said input string of character signals to said encoding dictionary;

associating an available output code with said extended string entry;

updating each string entry tag related to said extended string entry and to each stored string entry that is a prefix of said extended string entry based on said encoding master tag;

updating said encoding master tag; and

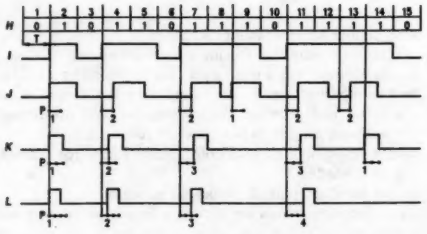
if said encoding dictionary is full, prior to performing said step of searching, freeing a stored string entry having a string entry tag with a value that is equal to said encoding master tag value, whereby a stored string entry that is not a prefix to another string entry and which was not recently referenced in the encoding process is freed so that the encoding dictionary may adapt to the input string of character signals.

5,151,698

METHOD FOR THE CODING OF A DIGITAL SIGNAL, CODER AND DECODER TO IMPLEMENT THIS METHOD, REGENERATION METHOD AND CORRESPONDING REGENERATOR UTILIZING PULSE POSITION MODULATION

Lucien Pophillat, Lannion, France, assignor to French State Represented by the Minister of Post, Telecommunications and Space (centre National d'Etudes des Telecommunications), France

Filed Sep. 18, 1990, Ser. No. 584,476
Claims priority, application France, Sep. 19, 1989, 89 12274
Int. Cl.[5] H03M *5/02*
U.S. Cl. 341—52 **15 Claims**



10. A method of coding a series of binary bits into the form of unipolar pulses of constant duration, one of said bits occurring each period of time called a bit time, the method comprising:

providing "n" binary patterns having at least a first bit and a last bit each, said binary patterns matching less than all possible sequences in said series;

dividing the bit time into "n" temporal positions;

establishing a correspondence between each of said binary patterns and temporal positions;

detecting one of said binary patterns in said series;

generating one of said pulses in the temporal position corresponding to the binary pattern detected; and

after the last bit of the binary pattern detected, resuming said detecting step.

5,151,699

DATA CONVERTING APPARATUS

Yoshiaki Moriyama, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Japan

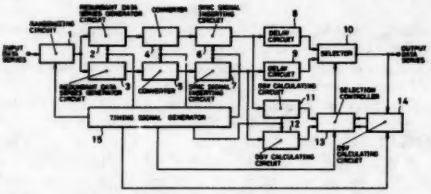
Continuation of Ser. No. 675,666, Mar. 27, 1991, abandoned. This application Mar. 18, 1992, Ser. No. 855,113
Claims priority, application Japan, Sep. 5, 1990, 2-235402
Int. Cl.[5] H03M *5/14*
U.S. Cl. 341—58 **20 Claims**

1. A data converting apparatus for converting an input data series being expressed in binary codes into an output data series, which comprises:

insertion means for repetitively inserting one of a predetermined number of DC control bits into an input data series,

at every predetermined bit interval to thereby generate a redundant data series;

encoding means for subjecting said redundant data series to a code conversion operation under a preselected conversion rule so as to generate said output data series; and



selection means for selecting a binary code for said one of predetermined number of DC control bits as a function of a DC component of said output data series.

5,151,700

SERIAL-PARALLEL TYPE A/D CONVERTER

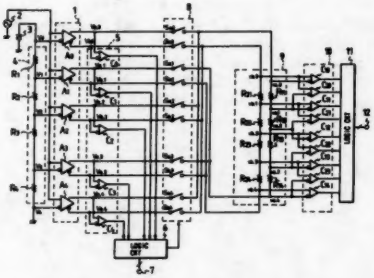
Akira Matsuzawa; Masaaki Kanoh, and Shoichiro Tada, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 30, 1990, Ser. No. 559,088

Claims priority, application Japan, Aug. 4, 1989, 1-203328

Int. Cl.[5] H03M *1/14*

U.S. Cl. 341—156 **9 Claims**



1. A serial-parallel type A/D converter comprising:

means for generating a plurality of different reference voltages;

a set of differential conversion circuits having first input terminals subjected in common to an analog input signal and second input terminals subjected to the respective reference voltages, and converting differences between voltages at the first and second input terminals into differential output voltages;

a first A/D conversion circuit comparing the analog input signal with the reference voltages to perform a higher-order A/D conversion of the input analog signal;

means for selecting at least two of the differential output voltages;

means for dividing an interval between the differential output voltages selected by the selecting means, and for generating divided voltages in accordance with said dividing; and

a second A/D conversion circuit comparing the divided voltages to perform a lower-order A/D conversion of the analog input signal.

5,151,701

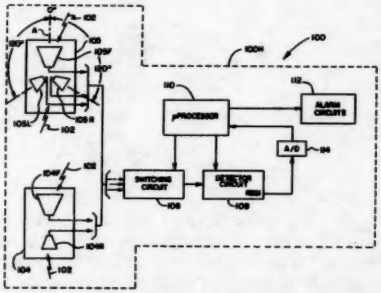
POLICE RADAR DETECTORS FOR DETECTING RADAR SIGNALS AND DETERMINING THE DIRECTIONAL ORIGIN OF THE SIGNAL SOURCE

Michael D. Valentine; Clarence R. Groth; Stephen R. Scholl, and Marwan E. Nussair, all of Cincinnati, Ohio, assignors to Valentine Research, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 659,625, Feb. 25, 1991, Pat. No. 5,083,129. This application Oct. 21, 1991, Ser. No. 780,262

Int. Cl.[5] G01S *7/40*

U.S. Cl. 342—20 **12 Claims**



1. A motor vehicle radar signal detector for alerting an operator of a motor vehicle to incoming radar signals, said detector comprising:

receiver means comprising a first antenna aimed in a first direction relative to said motor vehicle, a second antenna aimed in a second direction relative to said motor vehicle, and a third antenna aimed in a third direction relative to said motor vehicle for receiving incoming radar signals at frequencies within at least one frequency band, said first, second and third directions being different from one another;

radar signal detector means for generating radar identification signals which identify incoming radar signals;

connector means for connecting signals from said receiver means to said radar signal detector means;

processor means for controlling said connector means to selectively connect signals from said first, second and third antennas to said radar signal detector means and responsive to radar identification signals generated by said radar signal detector means to identify radar signals coming from said first, second and third directions relative to said motor vehicle and to generate direction signals identifying the direction of origin of incoming radar signals; and

alarm means for alerting an operator of a motor vehicle upon identification of incoming radar signals, said alarm means including direction indicating means responsive to said direction signals for identifying the direction of origin of incoming radar signals.

5,151,702

COMPLEMENTARY-SEQUENCE PULSE RADAR WITH MATCHED FILTERING FOLLOWING DOPPLER FILTERING

Harry Urkowitz, Philadelphia, Pa., assignor to General Electric Company, Moorestown, N.J.

Filed Jul. 22, 1991, Ser. No. 734,003

Int. Cl.[5] G01S *13/28*

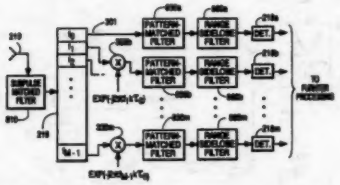
U.S. Cl. 342—134 **11 Claims**

1. A method for detecting anomalies, comprising the steps of:

transmitting toward an anomaly a first pulse set consisting of a predetermined plurality of first pulses, said pulses of said first set being dispersed in time pursuant to a predetermined phase code;

transmitting toward said anomaly a second pulse set consisting of said predetermined plurality of second pulses, said pulses of said second set being dispersed in time pursuant to a second phase code selected to be complementary to said predetermined phase code in a manner such that, after pulse compression of said first and second pulses, the resulting range sidelobes are substantially equal in amplitude and opposite in sign;

receiving echoes of said first and second pulses reflected from said anomaly to produce received first and second pulse sets;



Doppler filtering said received first and second pulse sets into a plurality of frequency components to produce a sequence of range values for each frequency component, each of said sequence of range values including said first and second code sequences;

for each said frequency components, matched filtering each of said first and second code sequences of range values to produce first and second compressed pulses;

summing said first and second compressed pulses; and

after said Doppler filtering step, converting at least some of said plurality of frequency components to a common frequency.

5,151,703

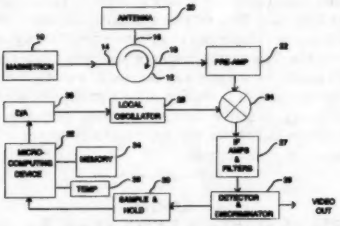
METHOD AND APPARATUS FOR IMPROVED AUTOMATIC FEQUENCY CONTROL

Mark G. Roos, Shawnee, Kans., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 6, 1991, Ser. No. 804,280

Int. Cl.[5] G01S *7/03*

U.S. Cl. 342—199 **10 Claims**



6. An apparatus for providing automatic frequency control of a variable frequency oscillator in a pulsed radar, comprising:

(a) discriminator means for producing a DC signal having an amplitude which indicates the frequency difference between an actual intermediate frequency and a desired intermediate frequency;

(b) sample and hold means for sampling said DC signal to produce a digital signal in response to said DC signal, said DC signal being sampled during an RF pulse transmission and during a receive time; and

(c) microcomputing means for producing a control signal that modifies a frequency of the variable frequency local oscillator, said control signal being produced using said digital signal.

5,151,704

METHOD FOR SIMULATING THE EFFECT OF ALTERNATIVE ANTENNA PATTERNS ON THE COVERAGE AND INTERFERENCE PATTERN OF A MOBILE RADIO SYSTEM

Krister Gunnar, and Ulf Tegth, both of Haninge, Sweden, assignors to Televerket, Farsta, Sweden

Continuation of Ser. No. 591,465, Oct. 1, 1990, abandoned. This application Jan. 16, 1992, Ser. No. 821,868

Claims priority, application Sweden, Sep. 29, 1989, 8903210

Int. Cl.[5] H01Q *3/00*; G01R *7/00*; H04Q *7/00*

U.S. Cl. 342—360 **2 Claims**

1. A method for simulating the effect of alternative antenna patterns on the coverage and interference pattern in cellular radio systems, comprising a number of base stations with associated individual coverage areas and mobile stations, characterized in that

signal strength values of an existing multi-directional antenna are measured for a plurality of relevant coordinates along a plurality of radials and at a plurality of distances from said existing antenna,

an ideal difference in antenna gain is formed by mathematically comprising an ideal radiation pattern of the antenna which is to be simulated with the ideal radiation pattern of the existing antenna, and

the measured field strength values are "weighted" with the ideal antenna gain difference to form a set of simulated field strength values.

5,151,705

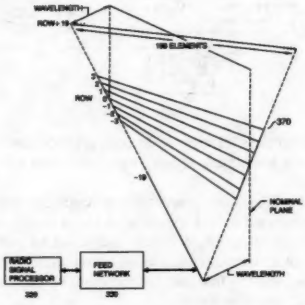
SYSTEM AND METHOD OF SHAPING AN ANTENNA RADIATION PATTERN

Scott L. Badger, Renton; John P. Braun, Issaquah, and Sperry H. Goodman, Kent, all of Wash., assignors to Boeing Aerospace and Electronics, Seattle, Wash.

Filed Feb. 15, 1991, Ser. No. 656,276

Int. Cl.[5] H01Q *3/22*

U.S. Cl. 342—368 **34 Claims**



1. An antenna having N subantennas, N being at least 3, each subantenna having a pattern having a main lobe and sidelobes on opposite sides of the main lobe, each pattern lying in a plane parallel to, and removed from, a pattern of an adjacent subantenna, comprising:

a first subantenna;

a second subantenna;

first means for pointing the pattern of the second subantenna at a non-zero angle relative to the pattern of the first subantenna; and

an Nth subantenna;

(N−1)th means for pointing the pattern of the Nth antenna

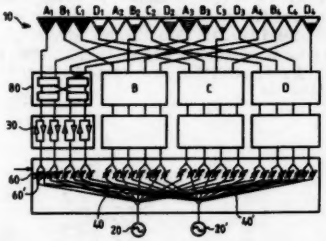
at the non-zero angle relative to the pattern of the (N−1)th antenna.

5,151,706

APPARATUS FOR ELECTRONICALLY CONTROLLING THE RADIATION PATTERN OF AN ANTENNA HAVING ONE OR MORE BEAMS OF VARIABLE WIDTH AND/OR DIRECTION

Antoine Roederer, Noordwijk, and Cornelis Van't Klooster, Voorhout, both of Netherlands, assignors to Agence Spatiale Europeenne, France

Filed Jan. 29, 1992, Ser. No. 828,266
Claims priority, application France, Jan. 31, 1991, 91 01086
Int. Cl.[5] H01Q 3/26, 3/36, 3/40
U.S. Cl. 342—372 7 Claims



1. Apparatus for electronically controlling the radiation pattern of an antenna having one or more beams of variable width and/or direction, the apparatus comprising:

an array of N radiating elements, subdivided into P subarrays of M elements each, where $M \cdot P = N$, each beam of a specified pattern using a plurality of elements selected from the elements of at least some of the subarrays;

a signal source common to all of the elements of the array;

power divider means having one input and N outputs to distribute the signal delivered by the source;

amplifier means for amplifying said signal; and

means for selectively exciting at least some of the elements with the amplified signal at a controlled phase shift so as to obtain the specified radiation pattern for the antenna;

the apparatus further comprising, between the power divider means and the radiating elements:

P groups of M phase shifter-and-amplifier modules placed at the output of the power divider means; and

P couplers each having M inputs and M outputs, said M inputs being connected to the M corresponding outputs of the associated group of phase shifter-and-amplifier modules, and said M outputs being connected to the M elements of the associated subarray;

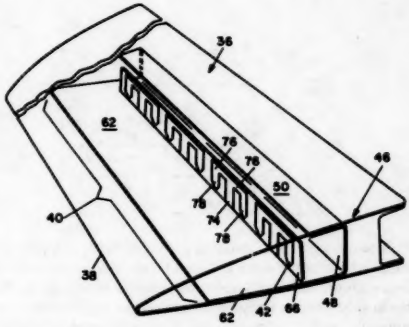
the phase shifts of the phase shifter-and-amplifier modules being selected in such a manner as to direct the power delivered by the source to those radiating elements that contribute to the specified radiation pattern, and thus to provide distributed amplification of the signal emitted by the source while maintaining an essentially identical and constant load on each amplifier regardless of the changes made to the radiation pattern.

5,151,707

LINEAR ARRAY ANTENNA WITH E-PLANE BACKLOBE SUPPRESSOR

Richard J. Kumpfbeck, Lloyd Harbor, and Peter W. Hannan, Smithtown, both of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.

Division of Ser. No. 339,883, Apr. 18, 1989, Pat. No. 5,111,214, which is a continuation of Ser. No. 917,743, Oct. 10, 1986, abandoned. This application Jan. 2, 1991, Ser. No. 636,752
Int. Cl.[5] H01Q 1/280, 9/380, 9/420
U.S. Cl. 343—705 12 Claims



1. A monopole antenna system with a radiation pattern primarily directed in a forward direction and a limited overall width in a transverse E-plane direction, having a composite reflector for providing operation with reduced E-plane back radiation, comprising:

an imaging ground plane section having a reflective surface substantially perpendicular to said transverse E-plane direction;

a plurality of monopole radiating elements spaced in a longitudinal direction transverse to said forward and transverse E-plane directions, each said element including a radiating segment extending in said transverse E-plane direction from a coupling point proximate to said reflective surface outward from said reflective surface to a furthermost point, for providing a free space radiation pattern having a low field strength region outward from said furthermost points of said plurality of elements; and

a composite reflector including:

a backwall section positioned behind said radiating segments and having a backwall width in said transverse E-plane direction substantially equal to said limited overall width of the antenna system, said backwall section terminating on one side at said reflective surface and on the other side in a backwall edge extending in said longitudinal direction; and

sidewall means, coupled along said backwall edge of said backwall section and extending forward substantially perpendicularly to said radiating segments and terminating in a longitudinally extending composite reflector edge, for positioning said composite reflector edge behind, and outward in said transverse E-plane direction from, said furthermost points in said low field strength region;

whereby, said composite reflector is effective to reduce E-plane back radiation as compared to a back reflector of similar width in said transverse E-plane direction, while having an overall width in said transverse E-plane direction approximately the width of said backwall section alone.

5,151,708

SHORTENED MAST ANTENNA WITH COMPENSATING CIRCUITS

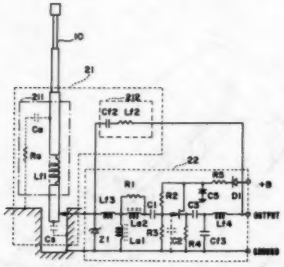
Kazuhiko Nakase, Tokyo, and Moriyoshi Kawasaki, Kanagawa, both of Japan, assignors to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 491,489, Mar. 9, 1990. This application Nov. 15, 1990, Ser. No. 614,280

Claims priority, application Japan, Mar. 10, 1989, 1-58790; Nov. 15, 1989, 1-297183

Int. Cl.[5] H01Q *1/00*

U.S. Cl. 343—722 2 Claims



1. A shortened radio antenna provided with compensating circuits whose outputs are coupled to an input of an AM/FM radio receiver, said shortened radio antenna comprising a mast antenna shorter than a resonant state and being provided on an automobile, an FM compensating circuit coupled to said mast antenna comprising only passive circuit elements for compensating for FM broadcast signals and an AM compensating circuit coupled to said mast antenna comprising active and passive elements for converting a high impedance into a low impedance and for compensating for AM broadcast signals, wherein said FM compensating circuit comprises a primary resonance circuit and a secondary resonance circuit, said primary resonance circuit resonating in said FM broadcast frequency band and comprising an impedance of said mast antenna and a loading coil which is attached to said mast antenna, said secondary resonance circuit resonating in said FM broadcast frequency band and comprising a coil and a capacitor, and said primary and secondary resonance circuits are electrostatically coupled by an electrostatic capacitance of an antenna attachment section of said mast antenna so as to form a double-tuned circuit.

5,151,709

TUNABLE SUPERCONDUCTIVE ANTENNA

Quirino Balzano, Plantation, and Robert E. Stengel, Ft. Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 10, 1989, Ser. No. 419,551

Int. Cl.[5] H01Q *7/00, 5/010*

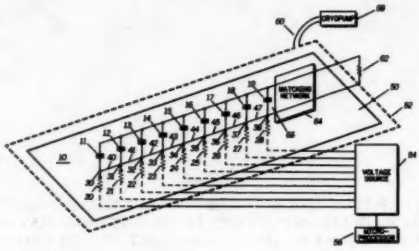
U.S. Cl. 343—741 8 Claims

1. An antenna, for receiving signals, each signal having a frequency, comprising:

a plurality of superconducting antenna segments;

decoupling means for selectively decoupling at least one antenna segment from the antenna in response to the frequency of the signal received; and

a plurality of superconducting transverse segments, each transverse segment being for coupling an antenna segment to an adjacent antenna segment when the transverse segment is in a superconducting state, and for decoupling the antenna segment from the adjacent antenna segment,



when the transverse segment is not in a superconducting state.

5,151,710

APPARATUS FOR MEASURING BENDING MOVEMENTS OF AN ANTENNA SUPPORT MAST, AND APPLICATION THEREOF TO CONTROLLING THE POINTING OF A MOTOR-DRIVEN ANTENNA

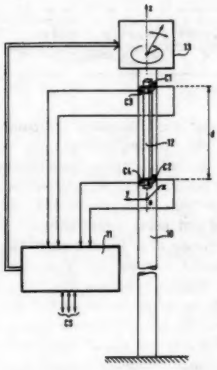
Alain de Place, Paris, France, assignor to Alcatel Transmission par Faisceaux Hertziens, France

Filed Dec. 19, 1990, Ser. No. 629,956

Claims priority, application France, Dec. 22, 1989, 89 17106

Int. Cl.[5] H01Q *3/00, 1/12;* G01R *7/00*

U.S. Cl. 343—766 5 Claims



1. A device for measuring bending movements of an antenna support mast having a longitudinal axis, said device comprising:

a support fixed to the side of said antenna support mast, in the vicinity of the free end of said mast, and extending in the longitudinal direction of the mast, at least two sets of sensors fixed to said support including a first set of sensors in a first plane, and a second set of sensors in a second plane, said sensors of each set being at a determined, longitudinal distance d from each other, said first and second planes extending parallel to the axis of said mast, the planes being angularly offset around the perimeter of said support and said sets of sensors sensing bending of the mast in said two angularly offset planes; and

a processor for processing signals delivered by the sensors; said processor including means for memorizing said signals, whereby; said support stiffens the relative positions of the sets of sensors to accommodate distortion due to

bending of the portion of mast bearing said support and permits the memorizing means of the processor to successively store the amplitude, pseudo-period and damping movement of the mast.

5,151,711

AUTOMOBILE ANTENNA AND METHOD OF MANUFACTURING THE SAME

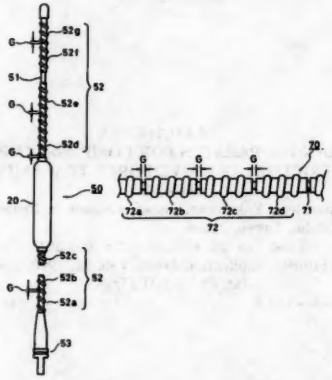
Minoru Taguchi, Tokyo, Japan, assignor to Harada Industry Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1990, Ser. No. 586,806

Claims priority, application Japan, Sep. 25, 1989, 1-248917; Apr. 16, 1990, 2-99641

Int. Cl.[5] H01Q *1/320, 1/270*

U.S. Cl. 343—715 5 Claims



3. An automobile antenna which substantially reduces wind noise generated as wind moves past the antenna, the wind creating a reduced pressure area behind the antenna when viewed from a direction in which the wind is moving, said automobile antenna comprising:

a flexible rod antenna element having a longitudinal axis;

a plurality of independent identical cylindrical members, each having a first and a second end portion, said plurality of cylindrical members being mounted around the rod antenna element in spaced-apart relation along the longitudinal axis of the rod antenna element so that a plurality of gaps are formed between adjacent ones of the first and second end portions of the plurality of identical cylindrical members, said gaps enabling the rod antenna element to flex without hinderance from said plurality of identical cylindrical members mounted thereon; and

each of said plurality of identical cylindrical members having an outer surface and having a given length along a longitudinal axis thereof;

air turbulence generating means formed integrally on and projecting from said outer surface of each of said cylindrical members along a substantial portion of said given length of each of said cylindrical members for generating air turbulence around said antenna, said gaps between adjacent cylindrical members also generating air turbulence;

the thus generated air turbulence substantially eliminating the reduced pressure area formed behind the antenna, thereby substantially reducing the wind noise.

5,151,712

METHOD OF TRANSFERRING VISCOUS SUBSTANCE BY APPLYING PLURAL VOLTAGES TO REDUCE ITS ADHESIVENESS

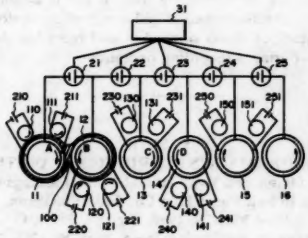
Kohzoh Arahara, Kawasaki; Toshiya Yuasa, Mitaka; Takashi Kai, Hadano; Noboru Tohyama, Kawasaki; Akihiro Mouri, Atsugi, and Kenichi Matsumoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1990, Ser. No. 527,178

Claims priority, application Japan, May 24, 1989, 1-128763; Jun. 7, 1989, 1-142898

Int. Cl.[5] B41J *2/005;* G01D *15/16*

U.S. Cl. 346—1.1 12 Claims



1. A method for transferring a viscous substance, comprising the steps of:

(a) providing a viscous substance which changes in adhesiveness corresponding to a polarity of a voltage applied thereto;

(b) disposing the viscous substance between a first electrode and a second electrode; and

(c) applying a voltage to a particular part of the viscous substance plural times before each transfer of said particular part of said viscous substance, thereby to reduce the adhesiveness of the viscous substance to the first electrode.

5,151,713

IMAGE RECORDING APPARATUS

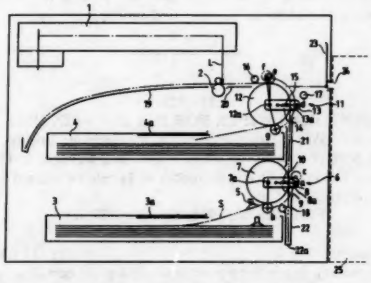
Keiichi Kawasaki, Tokyo; Keiji Ohkoda, Yokohama; Tomohiro Kudo, Yokohama, and Satoshi Shimizu, Yokohama, all of Japan, assignors to Cannon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 544,647

Claims priority, application Japan, Jun. 30, 1989, 1-169411; Jun. 30, 1989, 1-169412; Jun. 30, 1989, 1-169413; Dec. 15, 1989, 1-326926; Dec. 15, 1989, 1-326927; Mar. 26, 1990, 2-77654; Apr. 25, 1990, 2-109327

Int. Cl.[5] H04N *1/21*

U.S. Cl. 346—108 24 Claims



1. An image recording apparatus, comprising:

non-used sheet stock means for stocking a stack of non-used recording sheets;

feeding means for taking a recording sheet out of said non-

used sheet stock means and feeding the recording sheet to a recording position, the recording sheet being transported at a constant speed while at the recording position;

recording means for recording an image on the recording sheet at said recording position; and

recorded sheet stock means for stocking recorded recording sheets,

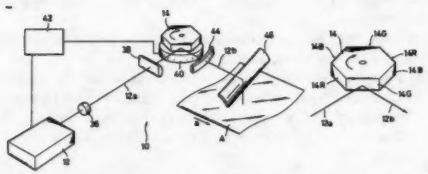
wherein said non-used sheet stock means and said recorded sheet stock means are arranged substantially in parallel, said recording position is disposed above said non-used sheet stock means and said recorded sheet stock means, a transport path for the recording sheet being recorded is arranged so as to almost surround at least one of said stock means, and the recording sheet is not in contact with a stack of sheets stocked in said non-used sheet stock means or a stack of sheets stocked in said recorded sheet stock means during a recording operation.

5,151,714

COLOR IMAGE RECORDING APPARATUS

Yoshiharu Okino, and Yoji Okazaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 29, 1990, Ser. No. 529,404
Claims priority, application Japan, May 26, 1989, 1-134415
Int. Cl.[5] H04N *1/21*
U.S. Cl. 346—108 **10 Claims**



1. A color image recording apparatus for recording a full color image by sequentially defining different scanning lines respectively corresponding to three primary colors on a material to be recorded by means of a laser beam deflected in a scanning direction, wherein the apparatus includes:

a laser light source capable of simultaneous emission of laser beams associated with exposure to red, green and blue light,

a light deflector for said laser beams having at least one reflecting face, and

means for selectively reflecting said laser beams, which changes the spectral characteristics of reflection of said laser beams in a sequential cycle defining scanning lines corresponding to the three primary colors, in order to choose the color to be recorded on the material.

5,151,715

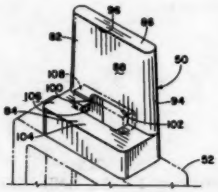
PRINTHEAD WIPER FOR INK-JET PRINTERS

Jefferson P. Ward, Brush Prairie; J. P. Harmon; Kris M. English, both of Vancouver, all of Wash., and Kenneth L. Christensen, Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 30, 1991, Ser. No. 737,629
Int. Cl.[5] B41J *2/165*
U.S. Cl. 346—140 R **19 Claims**

1. A unitary wiper for a printhead on a print cartridge in an ink-jet printer, said wiper being made from an elastomeric material and comprising:

a substantially planar beam having a pair of opposed substantially planar surfaces each of which terminates in a wiping edge at a first end of said beam and at a base at a second end of said beam; and



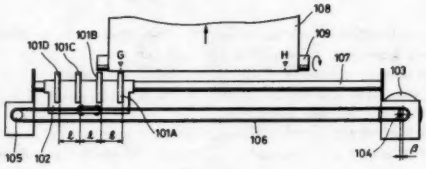
a slot formed in said beam, said slot extending into said beam from said second end and from one of said planar surfaces to the other.

5,151,716

RECORDING APPARATUS FOR COMPENSATING FOR ECCENTRICITIES IN DRIVE FORCE TRANSMISSION MEANS

Shinji Kanemitsu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1991, Ser. No. 658,591
Claims priority, application Japan, Feb. 26, 1990, 2-042514
Int. Cl.[5] G01D *15/24*
U.S. Cl. 346—140 R **11 Claims**



1. A recording apparatus for performing recording on a recording medium, said recording apparatus comprising:

a plurality of recording heads each for conducting recording on the recording medium;

a carriage for mounting said plurality of recording heads at predetermined spacings;

a motor for generating a driving force; and

driving force transmission means for transmitting the driving force from said motor to said carriage to move said carriage in a predetermined direction, said driving force transmission means being movable in transmission periods or fractions thereof, one transmission period corresponding to one period of movement of said transmission means beginning with a reference position and returning to the reference position,

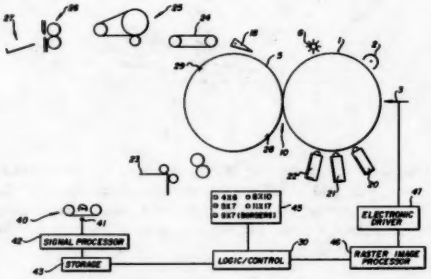
wherein the spacings between said plurality of recording heads are made substantially equal either to a distance through which said plurality of recording heads are moved in one transmission period of said driving force transmission means or to an integral multiple of said distance.

5,151,717

IMAGING METHOD AND APPARATUS USING DISCRETE RECEIVING SHEETS

Fereidoon S. Jamzadeh, Fairport; Arun Chowdry, Pittsford, and Kevin M. Johnson, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 533,237, Jun. 4, 1990, Pat. No. 4,994,827. This application Feb. 4, 1991, Ser. No. 651,844
The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.
Int. Cl.[5] G03G *15/01, 21/00;* B41B *17/00*
U.S. Cl. 346—157 4 Claims



1. A method of producing a plurality of reproductions from one or more originals, said method comprising:

forming an electrostatic image having a first size on an image member,

applying toner to said electrostatic image to form a toner image, and transferring said toner image to an intermediate transfer member and then transferring said toner image from said intermediate transfer member to a discrete receiving sheet having a leading edge and a trailing edge,

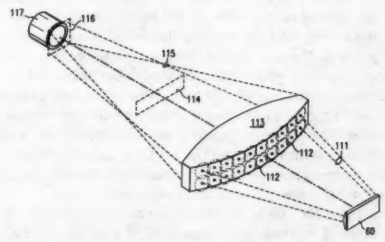
characterized in that said forming step includes forming said large size electrostatic image as an array of smaller images being formed from one of said originals, and said method further includes the step of cutting said receiving sheet according to the position of toner images transferred thereto corresponding to said smaller electrostatic images.

5,151,718

SYSTEM AND METHOD FOR SOLID STATE ILLUMINATION FOR DMD DEVICES

William E. Nelson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 31, 1990, Ser. No. 636,651
Int. Cl.[5] G01D *15/14*
U.S. Cl. 346—160 41 Claims



13. A xerographic printer comprising:

a spatial light modulator device operable to modulate light impacting a surface of said device wherein said device includes a plurality of individually controlled cells;

a plurality of individual solid state light emitting elements arranged in a unitary structure and focused on said spatial light modulator device; and

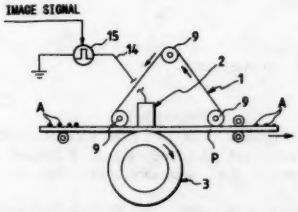
a receptor for receiving light from selected ones of said individually controlled cells.

5,151,719

DEVICE FOR THERMALLY FUSING AN UNFUSED IMAGE ON AN IMAGE HOLDING MEMBER

Eiichi Akutsu; Yoshio Shoji; Hiroo Soga, and Shigehito Ando, all of Kanagawa, Japan, assignors to Fuji Xerox Co, Ltd., Tokyo, Japan

Filed Aug. 19, 1991, Ser. No. 746,722
Claims priority, application Japan, Sep. 5, 1990, 2-233358
Int. Cl.[5] G01D *15/06*
U.S. Cl. 346—160.1 11 Claims



1. An image fusing device for thermally fusing an unfused image formed of a colored image forming material mainly made of thermoplastic resin on an image holding member, said image fusing device comprising:

heating means pressable against the image holding member carrying the unfused image, for heating the unfused image;

power supply means, including a contact electrode part disposed in a width direction of the heating means, for supplying electric energy to the heating means, said contact electrode part including a plurality of divisional electrodes divided in the width direction of the heating means;

control means connected to the power supply means, for controlling the amounts of the electric energies to be supplied to the plurality of divisional electrodes, respectively, in accordance with an image signal used for forming the unfused image on the image holding member; and

pressurizing means disposed opposite the heating means with the image holding member interposed therebetween, for providing a pressure contact between the contact electrode part of the power supply means and the image holding member.

5,151,720

CONVERTIBLE SWIZZLE STICK

Maurice S. Kanbar, 4 E. 77th St., New York, N.Y. 10021

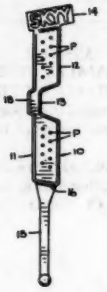
Filed Oct. 19, 1990, Ser. No. 600,596
Int. Cl.[5] G02C *7/16*
U.S. Cl. 351—46 7 Claims

1. A swizzle stick which is convertible into a lensless ophthalmic device comprising:

(a) a generally flat rectangular elongated strip section having a nose piece notch at its midsection to define a pair of like rectangular eyepieces joined to a nose piece, and a short lorgnette handle extending from one of the eyepieces, said eyepieces each having a pattern of pin holes adapted to project a clear image of an object being viewed by a related eye of a user; and

(b) a swizzle shank extending from and in the same plane as the other eyepiece whereby in a swizzle stick mode, the strip section functions as a long handle for the stick, the

swizzle shank being connected to the strip section by a junction of reduced thickness so that in an ophthalmic



device mode the shank may be broken off to transform the stick into an ophthalmic device.

5,151,721

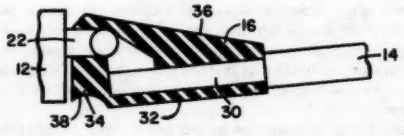
COMPRESSION JOINT FOR EYEGLASSES

Stephan C. Allendorf, Hoboken, N.J., and Thomas M. Dair, Valley Cottage, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Continuation-in-part of Ser. No. 523,369, May 15, 1990, abandoned. This application Mar. 20, 1991, Ser. No. 670,613

Int. Cl.[5] G02C *5/14, 5/22*

U.S. Cl. 351—121 **14 Claims**



1. In an eyeglass assembly embodying a lens frame and temples, and hinge systems connecting the lens frame to the temples, the temples being so hinged to the frames that the inner ends of the temples are spaced from the outer edges of the frame, a compression joint carried by each temple, the compression joint being composed of a sleeve portion fitted over the inner end of a temple, and a resiliently compressible portion at one end of the sleeve, the resiliently compressible portion being of greater thickness than the wall of the sleeve and having a vertical chamfer at its outer edge, the resiliently compressible portion occupying the space between the frame and the temple as the temple is opened so that the temple may swing beyond the normal stop-limiting position and will be biased toward a partially closed position, whereby one size eyeglass assembly fits a plurality of head sizes.

5,151,722

VIDEO DISPLAY ON SPECTACLE-LIKE FRAME

Robert W. Massof, Baltimore, Md.; Donald C. O'Shea, Atlanta, Ga., and Thomas W. Raasch, Baltimore, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Nov. 5, 1990, Ser. No. 609,243

Int. Cl.[5] G02C *1/00, 11/00*

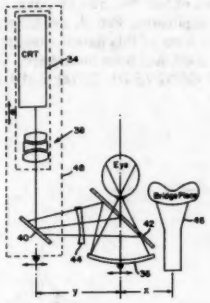
U.S. Cl. 351—158 **22 Claims**

1. A head mounted video display, comprising:

a goggle like frame having side arms adapted to run alongside the users head;

a curved mirror secured to said frame and adapted to be positioned in front of a user's eye to relay and focus a video image onto the retina;

a small video display positioned in said side arm for generating a video image; and,



folding optics means for placing a magnified intermediate image of said video display into the focal plane of the curved mirror, so that an image of said video display subtending a large visual angle will be focused on the user's retina.

5,151,723

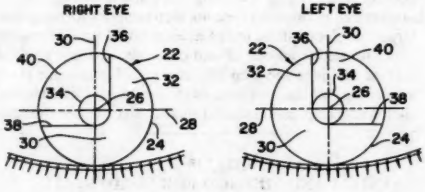
MULTIFOCAL CONTACT LENS

Akira Tajiri, 1630 Eleventh St., Reedley, Calif. 93654

Continuation of Ser. No. 336,122, Apr. 11, 1989, abandoned. This application Dec. 20, 1991, Ser. No. 810,569

Int. Cl.[5] G03B *21/46*

U.S. Cl. 351—161 **21 Claims**



1. A multifocal contact lens comprising:

a generally spherical lens body having,

a generally convex outer surface,

a generally concave inner surface operable to conform to the corneal curvature of an eye, and

the lens body includes an optical center point and a horizontal axis and a vertical axis which intersect through the optical center point of the lens body said axes being horizontal and vertical in the sense of the lens being worn on the eye of a patient in a generally erect posture;

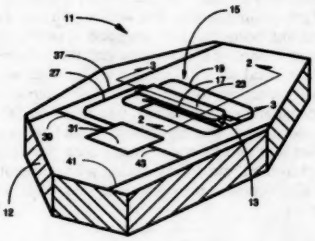
at least one near vision prescriptive value fashioned onto a portion of the surface of said lens body and extending superiorly and inferior with respect to said horizontal axis and in the superior portion asymmetrically in a nasal direction with respect to the vertical axis and in the inferior temporal portion asymmetrically in the inferior direction with respect to the horizontal axis;

at least one far vision prescriptive value fashioned onto the remaining portion of the surface of said lens body, said remaining portion having the far vision prescriptive value including at least the optical center point of said lens body and the superior and temporal portions of the lens body with respect to the horizontal and vertical axis respectively.

5,151,724
DYNAMIC HOLOGRAPHIC DISPLAY WITH CANTILEVER

Dan Kikinis, 3945 Freedom Cir., Ste. 320, Santa Clara, Calif. 95054

Filed Jan. 30, 1991, Ser. No. 648,152
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 13 Claims



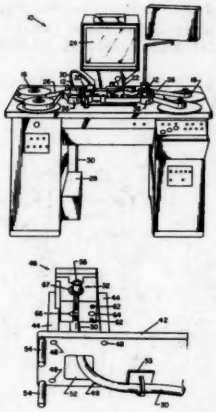
1. A cell for a dynamic holographic display comprising:
cantilever means extending from a base structure, said cantilever means having a root end adjacent said base structure and a free end opposite said root end, said cantilever means comprising substantially electrically semi-conductive material;
an electrically non-conducting film extending from the root end of said cantilever means for a portion of the length of said cantilever means;
an electrically conductive and light reflecting film overlying said electrically nonconductive film, making electrical contact with the electrically semi-conductive material of said cantilever means away from the root end;
control means for supplying an electrical current to said cantilever means and for controlling said current; and
electrical connection means for connecting said control means to said electrically conductive and light reflecting film, such that said electrical current passes through said electrically conductive and light reflecting film away from said free end, into said cantilever means, and through the material of said cantilever means back to said base structure, said current causing heating of said cantilever means such that said cantilever means deforms, moving said electrically conductive and light-reflective film as a controllable light-reflective element of said holographic display.

5,151,725
APPARATUS AND METHOD FOR EDITING FILM

Gordon E. Liljegren, Burbank, and David S. Inglish, La Crescenta, both of Calif., assignors to The Walt Disney Company, Burbank, Calif.

Filed Jan. 8, 1991, Ser. No. 638,635
Int. Cl.[5] G03B *21/00*
U.S. Cl. 352—129 22 Claims

1. A film editing machine, comprising:
film transport means for providing a film pathway;
a light source that produces an illuminating light;
light transmitting means for receiving light from the light source transmitting the light while shifting the color temperature of the light;
optical transmission means for receiving the shifted light from the light transmitting means, further shifting the color of the light to a predetermined range, and directing it across the film pathway for producing a projected image; and
a viewing screen that can display the projected image;
wherein the light source is remotely mounted from the optical transmission means and the light transmitting means comprises a light guide that receives light from the light source at a first guide end and transmits that light to

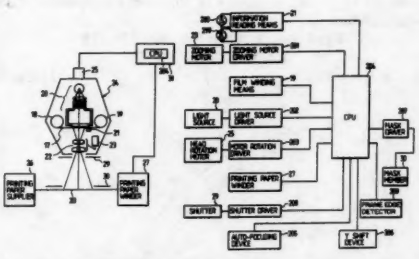


a second guide end adjacent the optical transmission means.

5,151,726
CAMERA OR PRINTER CAPABLE OF AUTOMATICALLY CHANGING PRINT SIZE

Tomonori Iwashita, Yokohama; Akira Egawa, Machida, and Yoshiaki Sugiyama, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1989, Ser. No. 349,531
Claims priority, application Japan, May 9, 1988, 63-113271; May 9, 1988, 63-113272; May 9, 1988, 63-113273; May 9, 1988, 63-113274
Int. Cl.[5] G03B *29/00*
U.S. Cl. 354—75 16 Claims



1. A photographic print control system comprising:
a camera which comprises:
(a) setting means for setting a size of an area to be printed on a recording medium;
(b) recording means for recording information pertaining to the set size, wherein said recording means comprises an optical recording means; and
(c) cancelling means for cancelling the information recorded by said recording means; and
a printing apparatus which comprises:
(a) reading means for reading the information recorded by said recording means; and
(b) printing means for printing a photographed image in the set size in response to the information read by said reading means.

5,151,727
BATTERY COUPLER

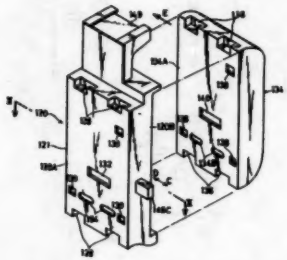
Hidemi Sasaki, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 15, 1990, Ser. No. 597,222

Claims priority, application Japan, Oct. 17, 1989, 1-269860; Oct. 18, 1989, 1-271253; Dec. 19, 1989, 1-328750; Sep. 12, 1990, 2-239989

Int. Cl.[5] G03B *7/26, 15/03;* **H04N** *5/225*

U.S. Cl. 354—76 **8 Claims**



1. A battery coupler mountable to a battery mounting portion of a video tape recorder integral with a camera and allowing mounting of a camera battery thereto, said battery coupler comprising:

a means for electrically connecting said camera battery with said video tape recorder integral with a camera; and,

a holding means including a receiving portion to be in contact with a lower surface of box-type accessories and a press-down portion to be in contact with an upper surface of said box-type accessories for holding said box-type accessories between said receiving and press-down portions.

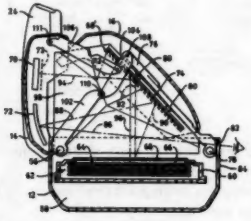
5,151,728
6-BAR ERECTING SYSTEM

Donald H. Hendry, Rockland; Bruce K. Johnson, Andover; Joanne M. Krawczyk, Dracut, and Bruce C. Vierstra, Rockport, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 1, 1991, Ser. No. 739,320

Int. Cl.[5] G03B *17/50*

U.S. Cl. 354—83 **12 Claims**



1. A compact folding camera comprising:

means for defining a film plane;

a first housing section including means for supporting a film unit at said film plane;

a second housing section mounting an objective lens, said second housing section being pivotally attached to said first housing section for movement between an operative erect position and an inoperative folded position overlying said film plane;

a mirror assembly, including a mirror, pivotally attached to said first housing section for movement of said mirror between an operative erect position and an inoperative folded position wherein said mirror overlies said film plane; and

an erecting system for coordinating the movement of said second housing section and said mirror between their said erect and folded positions comprising a first link and a second link with each of said links having a distal end and a proximal end and with each of said links being pivotally attached to one another at their said distal ends, with a proximal end of said first link being pivotally attached to said first housing section and with a proximal end of said second link being pivotally attached to said mirror assembly, and a third link having an end thereof pivotally attached to said second housing section and another end pivotally attached to said second link intermediate of its said distal and proximal ends, whereby said erecting system coordinates the movement of said second housing member and said mirror assembly such that they are precluded from physically interfering with one another when manually actuated between their said erect and folded positions.

5,151,729
ZOOM LENS BARREL

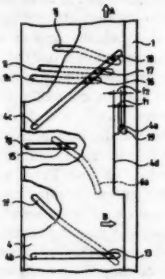
Toru Takayama, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Apr. 8, 1991, Ser. No. 681,780

Claims priority, application Japan, Apr. 10, 1990, 2-37711[U]

Int. Cl.[5] G03B *1/18*

U.S. Cl. 354—195.12 **1 Claim**



1. A zoom lens barrel comprising:

a plurality of lens groups;

a fixed barrel having integrally and securely a mount portion for mounting said zoom lens barrel on a camera body;

a zoom operation ring which is moved along an optical axis relative to said fixed barrel and causes lens groups associated with zooming to shift along the optical axis so as to execute a zooming action;

a focus operation ring which is rotatably supported by said zoom operation ring and is moved with said zoom operation ring along the optical axis, and causes lens groups associated with focusing to shift along the optical axis through its own rotation so as to execute a focusing action;

a cam ring which, during the focus action cooperates with said focus operation ring and is moved along the optical axis relative to said fixed barrel to thereby shift lens groups associated with the focusing along the optical axis, and during the zooming action interlocks with said zoom operation ring to rotate to thereby shift the lens groups associated with the zooming along the optical axis;

a first nearest photographing distance limit mechanism provided between said focus operation ring and said zoom operation ring, the mechanism restraining rotation of said focus operation ring during the focus action so as to re-

strict a backward shift of said cam ring, thereby restricting a backward shift of the lens groups associated with the focusing; and

a second nearest photographing distance limit mechanism including a limit member provided on said fixed barrel and an abutment surface, adapted to abut with said limit member, provided on said cam ring, the mechanism restraining a backward shift of said cam ring through an abutment of said limit member with said abutment surface during the focusing action, thereby restricting a backward shift of the lens groups associated with the focusing;

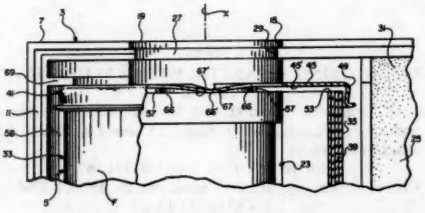
wherein within a specified focal length range the rotation of said focus operation ring is restrained by said second limit mechanism before said first limit mechanism acts, and in a focal length range other than said specified range the rotation of said focus operation ring is restricted by said first limit mechanism.

5,151,730

FILM CASSETTE

David B. Kemp, Fairport; Christopher P. McCormick, Rochester, and Mark D. Fraser, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 15, 1991, Ser. No. 655,944
Int. Cl.[5] G03B *17/26*
U.S. Cl. 354—275 **2 Claims**



1. A film cassette wherein a film spool comprises (a) a spool core supported for rotation in an unwinding direction to thrust a leader section of a film roll coiled about said spool core to the exterior of said cassette, (b) a pair of flanges radially confining said film roll and loosely coupled coaxially with said spool core normally to permit the spool core to be rotated relative to said flanges in the unwinding direction, and (c) engagement means rotatably fixed to said spool core for rotation with the spool core relative to said flanges in the unwinding direction to move into engagement with one of the flanges to make said one flange rotate in unity with the spool core in the unwinding direction, is characterized in that:

said one flange is resiliently flexible; and

biasing means is positioned to distort said one flange for urging the one flange firmly against said engagement means to ensure the engagement means will engage the one flange when said spool core is rotated relative to said flanges in the unwinding direction.

5,151,731

PROCESSING SOLUTION REPLENISHMENT

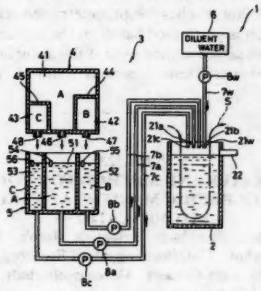
Minoru Yamada, Minami-ashigara, and Takashi Toyoda, Hatano, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1990, Ser. No. 600,365
Claims priority, application Japan, Oct. 20, 1989, 1-273304
Int. Cl.[5] G03D *3/02*
U.S. Cl. 354—324 **17 Claims**

1. A method for replenishing a processing solution having a plurality of partial stocks diluted with a diluent to a processing tank, comprising the steps of:

providing a cartridge having discrete compartments partitioned therein and filled with the partial stocks in amounts corresponding to a desired mix proportion of the partial stocks,

transferring the partial stocks from the cartridge compartments into discrete compartments partitioned in a storage tank, respectively, and



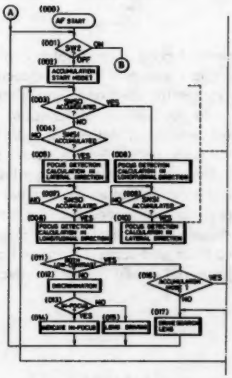
delivering the partial stocks from the tank compartments in amounts corresponding to the desired mix proportion of the partial stocks to the processing tank along with the diluent.

5,151,732

AUTOMATIC FOCUSING APPARATUS

Akira Akashi, and Terutake Kadohara, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 400,924, Aug. 30, 1989. This application Aug. 5, 1991, Ser. No. 742,475
Claims priority, application Japan, Aug. 31, 1988, 63-216903; Aug. 31, 1988, 63-216904
Int. Cl.[5] G03B *13/36*
U.S. Cl. 354—402 **16 Claims**



1. A focus detection apparatus comprising:

a plurality of accumulation-type sensor sections for respectively receiving light from different areas, each said sensor section starting a signal accumulation operation in response to a first signal;

a monitor circuit for independently monitoring a signal accumulation state of each said sensor section, said monitor circuit outputting a second signal when the accumulation state of said each sensor section reaches a predetermined state;

a reading circuit for supplying said second signal to a said sensor section which has reached said predetermined

state, the said sensor section to which said second signal is supplied outputting the accumulated signal before another said sensor section outputs its accumulated signal; and

a signal processing circuit for receiving said accumulated signal from the said sensor section to which said reading circuit output said second signal, and for starting a focus calculation, whereby, if the accumulation state of the said sensor section reaches the predetermined state, the focus calculation is performed based on the accumulated signal of the said sensor section even if the accumulation operation of other said sensor sections is still being performed.

5,151,733

APPARATUS AND METHOD FOR COPYING PHOTOGRAPHIC MASTERS AT VARIABLE MAGNIFICATIONS

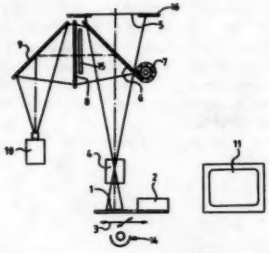
Günter Findeis, Sauerlach; Friedrich Jacob, Munich, and Eberhard Schulz, Unterhaching, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 13, 1991, Ser. No. 759,891

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1990, 4031111

Int. Cl.[5] G03B *13/28*

U.S. Cl. 355—45 **20 Claims**



1. A copier, particularly a photographic copier, comprising means for supporting a master to be reproduced at a predetermined location; means for directing light along a first path, which includes said predetermined location, in a direction towards the latter; means for deflecting light from said first path into a second path, said deflecting means being movable between an operative position in aid first path downstream of said predetermined location and an inoperative position out of said first path; means in said second path for forming an image of the master; means for displaying the image at a second location removed from said second path; and means for positioning copying material in said first path adjacent to a predetermined plane.

5,151,734

PROCESS CARTRIDGE DETACHABLY MOUNTABLE TO IMAGE FORMING APPARATUS FEATURING A PERIPHERALLY SUPPORTED IMAGE BEARING DRUM

Tadayuki Tsuda, Kawasaki; Kazushi Watanabe, Yokohama; Isao Ikemoto, Kawasaki, and Shinichi Sasaki, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1990, Ser. No. 580,563

Claims priority, application Japan, Sep. 16, 1989, 1-238382

Int. Cl.[5] G03G *15/00*

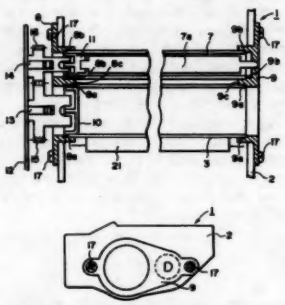
U.S. Cl. 355—200 **24 Claims**

1. A process cartridge detachably mountable to an image forming apparatus, comprising:

an image bearing member;

process means actable on said image bearing member;

a frame for supporting said process means; and



supporting means mounted on said frame for rotatably supporting an outer periphery of said image bearing member.

5,151,735

SHEET STORING APPARATUS WITH A PLURALITY OF TRAYS

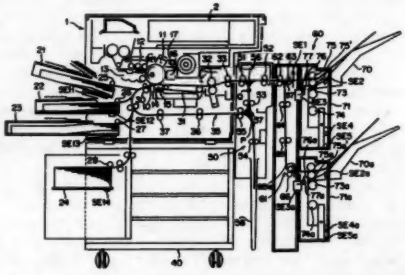
Hiroki Yamashita, Okazaki, and Kiyoshi Emori, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 24, 1991, Ser. No. 734,962

Claims priority, application Japan, Jul. 26, 1990, 2-200060

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—207 **16 Claims**



1. A sheet storing apparatus for stacking sheets discharged from an image forming machine and storing the sheets therein, the sheet storing apparatus comprising:

a plurality of sheet storing means each of which has driving means to enable independent sheet storing operation and a tray on which sheets are stacked, said driving means including a mechanism for moving the tray horizontally at predetermined intervals;

detection means for detecting failure in the sheet storing operation of each of the sheet storing means; and

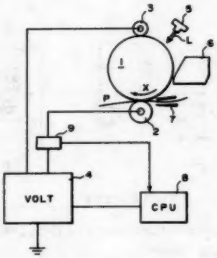
control means for, when the detection means detects failure in the sheet storing operation of one of the sheet storing means, controlling another sheet storing means which is operative normally to move the tray thereof horizontally and to stack successive sheets on the tray.

5,151,736

IMAGE FORMING APPARATUS WITH CONTROLLED TRANSFER VOLTAGE

Yukihiro Ohzeki; Junji Araya; Tatsunori Ishiyama, all of Yokohama; Yasushi Sato, and Kimio Nakahata, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 515,871, Apr. 27, 1990, abandoned. This application Apr. 8, 1991, Ser. No. 682,404
Claims priority, application Japan, Apr. 28, 1989, 1-107415
Int. Cl.[5] G03G *15/16, 15/00*
U.S. Cl. 355—208 **39 Claims**



1. An image forming apparatus, comprising:
a movable image bearing member;
an image forming means for forming an image on said image bearing member;
an image transfer charging member contactable to a back side of a transfer material at an image transfer position for effecting transfer of an image from said image bearing member to the transfer material;
constant current control means for constant current controlling current through said image transfer charging member when there is no transfer material in the transfer position; and
determining means for determining a charging voltage for application to said image transfer charging member, said determining means determines the charging voltage in accordance with a voltage produced during the constant current control by said constant current control means, wherein a voltage or current applied to said image transfer charging member during an image transfer operation is limited within a predetermined range.

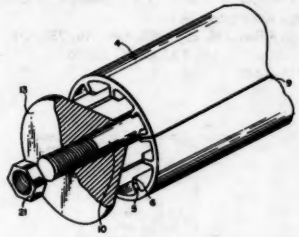
5,151,737

PHOTOCONDUCTIVE DRUM HAVING EXPANDABLE MOUNT

Kevin M. Johnson, and Michael S. Kowalczyk, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 4, 1990, Ser. No. 533,215
Int. Cl.[5] G03G *15/00, 21/00*
U.S. Cl. 355—211 **9 Claims**

1. A photoconductive drum comprising:
a flexible photoconductive loop which may have opposite ends which differ in internal circumference,
an expandable mount for said loop, said mount including a generally cylindrical-shaped shell having an axis of rotation, opposing open ends and a slit between the ends, said slit permitting expansion of said shell,
a pair of wedges mounted radially closer to said axis than said shell,
means for exerting a force on said wedges tending to change the axial distance between said wedges, said wedges and said shell having cooperative cam surfaces which convert said force to a cooperative pair of forces sufficient to expand opposite ends of said shell to conform separately the ends of the shell to any conicity of the loop caused by



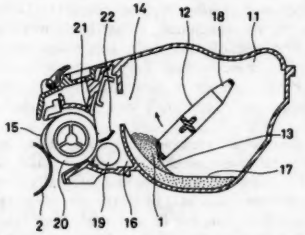
a difference in internal circumference of the opposite ends of the loop.

5,151,738

DEVICE FOR CONVEYING DEVELOPER IN A DEVELOPING DEVICE

Shinichi Takemoto, Toyokawa; Hirofumi Hasegawa, Hadano; Naoki Toyoshi, Toyohashi; Tateki Oka, Atsugi; Hiroshi Goto, and Narutaka Yoshida, both of Machida, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 26, 1991, Ser. No. 721,308
Claims priority, application Japan, Jun. 27, 1990, 2-169606
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—245 **16 Claims**



1. A developing device for developing an electrostatic latent image formed on an electrostatic latent image support member, comprising:
developer supplying means for supplying a developer to said electrostatic latent image support member;
a developer containing portion containing the developer to be supplied to said developer supplying means;
a rotating member which is rotated about an axis of rotation in said developer containing portion;
a conveying member attached to an end of said rotating member in the radial direction of the axis of rotation for conveying the developer above the bottom part of the developer containing portion to said developer supplying means with the developer in the bottom part of the developer containing portion being left; and
an agitating member attached to an end of the rotating member on the opposite side of said conveying member in the radial direction of the axis of rotation for agitating in the developer containing portion the developer remaining in the bottom part of the developer containing portion without being conveyed by the conveying member.

5,151,739

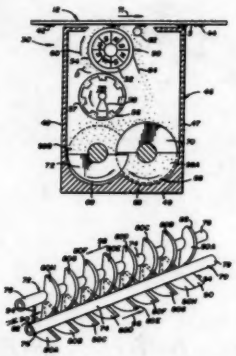
DEVELOPMENT APPARATUS AND IMPROVED AUGER DEVICE FOR USE THEREIN

Edwin A. Hediger, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1991, Ser. No. 737,304

Int. Cl.[5] G03G *15/06*

U.S. Cl. 355—245 15 Claims



1. A single piece auger device for use in a development apparatus of an electrostatographic reproduction machine to move, mix and triboelectrically charge developer material, the single piece auger device comprising:

(a) a rigid round shaft having a first end and a second end for mounting in a development apparatus housing;

(b) a plurality of semi-elliptical blade members for moving developer material longitudinally relative to said shaft, said plurality of semi-elliptical blade members being formed integrally with said shaft so as to require no blade-member-to-shaft assembly, said plurality of semi-elliptical blade members including a first blade member adjacent said first end of said shaft, and a last blade member towards said second end of said shaft, and each semi-elliptical blade member of said plurality of blade members extending radially relative to a longitudinal axis of said shaft;

(c) a cross-transfer member for moving developer material radially relative to said shaft, said cross-transfer member being formed connected to, and integrally with, said last blade member, and said cross-transfer member extending longitudinally relative to said shaft from said last blade member to a mounting point adjacent said second end of said shaft so as to eliminate a dead spot in developer material movement from a longitudinal to a radial direction relative to said shaft.

5,151,740

IMAGE FORMING APPARATUS CAPABLE OF AUTOMATIC CONTROL OF DEVELOPER DENSITY

Hitoshi Fujimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 25, 1991, Ser. No. 691,403

Claims priority, application Japan, Apr. 27, 1990, 2-114858

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—246 9 Claims

1. An image forming apparatus comprising:

means, detachably mounted on the image forming apparatus, for supplying a developer to the image carrier to develop a latent image formed on the image carrier;

a process unit detachably mounted on the image forming apparatus and containing the image carrier and developing apparatus;

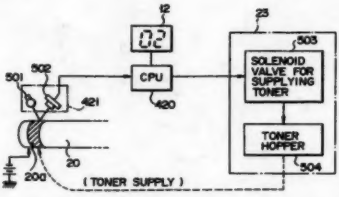
light generating means for generating a light to radiate the developer supplied on the image carrier by the supplying means;

means for discriminating whether or not a new process unit for forming the image has been mounted in the main body of the image forming apparatus;

means for generating a pulse signal to control the amount of the light generated by the light generating means, only when a discriminating means discriminates that a new process unit has been attached to the main body;

means for detecting the density of the developer supplied to the image carrier by detecting the light radiated onto the image carrier by the light generating means;

voltage generating means for generating a voltage value



corresponding to the density of the developer detected by the detecting means;

means for changing the pulse width of the pulse signal generated by the pulse signal generating means in accordance with the voltage value generated by the voltage generating means;

means for controlling the supplying means to make the density of the developer supplied to the image carrier at a predetermined density value respond to the voltage value generated by the voltage generating means; and

means for storing the pulse width of the pulse signal changed by the changing means when the density of the developer detected by the detecting means is the predetermined density value.

5,151,741

ELECTROPHORETIC IMAGING DEVICE

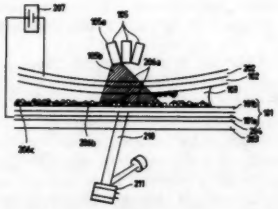
Toshiaki Kakutani; Nobuyuki Yanase; Hitoshi Fukushima, and Toshiya Takahata, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed May 9, 1991, Ser. No. 697,387

Claims priority, application Japan, May 14, 1990, 2-123283; Oct. 18, 1990, 2-279796; Oct. 18, 1990, 2-279797; Apr. 11, 1991, 3-79264

Int. Cl.[5] G03G *15/04, 15/10, 17/04*

U.S. Cl. 355—257 3 Claims



1. An electrophoretic imaging device, comprising:

an electrosensitive layer;

an insulating body being arranged to confront said electrosensitive layer, said electrosensitive layer and said insulating body allowing a developing solution to be filled therebetween said developing solution being prepared by dispersing at least two kinds of electrosensitive toners into an insulating solvent;

means for applying a voltage between said electrosensitive layer and said insulating body;

means for irradiating said developing solution with a toner selection light, said toner selection light causing at least one kind of said electrosensitive toner to be selectively sensitized; and

electrosensitive layer exposing means for causing image data to be photosensitively written to said electrosensitive layer;

wherein said electrosensitive layer comprises a photoelectric charge generating layer and a light-shielding layer, said light-shielding layer being arranged closer to said insulating body than said photoelectric charge generating layer; and

wherein said light-shielding layer of said electrosensitive layer comprises an electric charge transferring layer having a light-shielding property.

5,151,742

FIXING DEVICE SHEET GUIDE APPARATUS

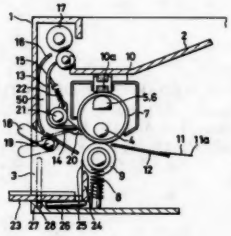
Yasuyoshi Yamaguchi, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1990, Ser. No. 611,294

Claims priority, application Japan, Nov. 22, 1989, 1-135613[U]

Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—285 **3 Claims**



3. A sheet guide apparatus comprising:

a rotatable fixing roller having heating means;

a rotatable pressure roller pressed upwardly against said fixing roller so that a sheet may be ejected from between said fixing roller and said pressure roller;

a substantially vertically extending resilient leaf having an upper edge thereof brought into contact with the outer peripheral surface of said pressure roller on the sheet delivery side and extending downwardly; and

a sheet receiving unit for receiving an ejected sheet, said sheet receiving unit having an open top and having a rear end connected to a lower portion of said resilient leaf and having a bottom face extending in a direction in which sheet is to be delivered.

5,151,743

IMAGE FORMING APPARATUS HAVING FLASH LIGHT FIXING APPARATUS WITH IMPROVED HEAT CHARACTERISTICS

Masanori Yaguchi, Oyama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 7, 1991, Ser. No. 637,774

Claims priority, application Japan, 2-10399

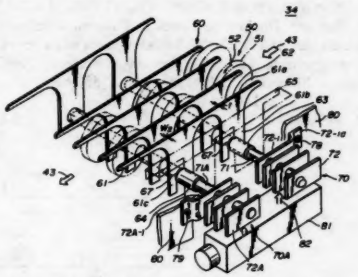
Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—288 **11 Claims**

1. An image forming apparatus having a flash light fixing apparatus with improved heat characteristics, comprising a flash light fixing unit to radiate a flash light onto paper to which toner has been transferred, and a paper feed apparatus provided opposite the flash light fixing unit

said paper feed apparatus comprising a paper feed mechanism and a paper guide mechanism that guides paper that is fed by said paper feed mechanism,

said paper guide mechanism comprises a plurality of metal plates vertically disposed, so that edge surfaces thereof are



opposite said flash light fixing unit and are arranged so as to extend in the same direction as the direction of said paper feed, said edge surfaces of said metal plates guiding the paper.

5,151,744

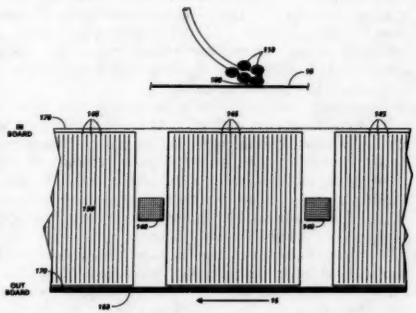
CLEANER BRUSH RETONE FILM CONTROL

Douglas A. Lundy, Webster; Kip L. Jugle, Rochester; Daniel W. MacDonald, Farmington; Robin E. Berman, and Carl B. Hurwitch, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 9, 1991, Ser. No. 742,817

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—296 **16 Claims**



1. A method of replenishing particles of a first polarity in a cleaner brush adapted to contact a photoreceptor used in a printing machine of the type having at least two different color developer units and a sheet feeder for advancing a sheet to a transfer station for transferring an image, having particles of a second polarity opposite in polarity to the first polarity, developed on the photoreceptor to the sheet, comprising the steps of:

de-energizing the sheet feeder, transfer station and one of the developer units;

recording a latent image on the photoreceptor in an image region;

developing the latent image with particles of the first polarity from the other developer unit; and

removing the first polarity particles from the photoreceptor with the cleaning brush so that the first polarity particles adhere to the brush, and, subsequently, removing the second polarity particles from the photoreceptor with the cleaning brush having the first polarity particles adhering

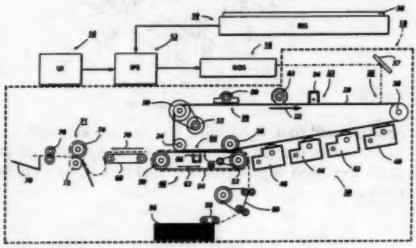
thereto preventing smearing on the photoreceptor and abrading film therefrom.

5,151,745

SHEET CONTROL MECHANISM FOR USE IN AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Scott C. Durland, Rochester; James R. Cassano, Penfield; Richard M. Dastin, and Roger M. Swanson, both of Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 5, 1991, Ser. No. 755,466
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—313 **8 Claims**



1. An apparatus for advancing a sheet in a predetermined path comprising:

means for advancing the sheet in the path;

first means for controlling movement of the sheet while it is being advanced in the path, said first controlling means being in contact with the sheet in a first mode of operation of said first controlling means and being spaced apart from the sheet in a second mode of operation of said controlling means;

second means for controlling movement of the sheet while it is being advanced in the path, said second controlling means being in contact with the sheet in a first mode of operation of said second controlling means and being spaced apart from the sheet in a second mode of operation of said second controlling means;

an intermediate member movable between a first location and a second location, each of said first controlling means and said second controlling means being positioned in one of its respective modes of operation in response to said intermediate member being positioned at its first location and being positioned in the other of its respective modes of operation in response to said intermediate member being positioned at its second location; and

third means for controlling movement of the sheet while it is being advanced in the path, said third controlling means being in contact with the sheet in a first mode of operation of said third controlling means and being spaced apart from the sheet in a second mode of operation of said third controlling means, and further, said third controlling means being positioned in one of its modes of operation in response to said intermediate member being positioned at its first location and being positioned in the other of its modes of operation in response to said intermediate member being positioned at its second location.

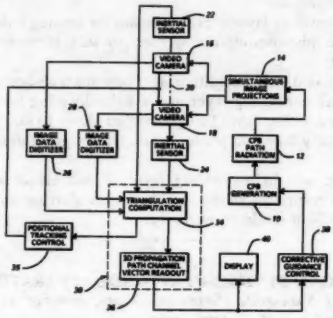
5,151,746

OPTICAL TRACKING OF CHARGED PARTICLE BEAMS

Irving L. Kofsky, Wellesly Hill, and Christian A. Trowbridge, Burlington, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1991, Ser. No. 677,899
Int. Cl.[5] G01J *1/20*
U.S. Cl. 356—1 **13 Claims**

1. In a method of optically determining the geometry of a beam propagated along a path remotely spaced from a monitoring platform, the steps of: recording images separately formed by said beam along said path and simultaneously projected to spaced points on the monitoring platform during beam tracking operation; measuring positional orientations of



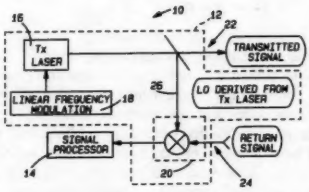
the recorded images at said spaced points relative to the platform; and calculating location and direction of the path in space from the measured orientations during the tracking operation.

5,151,747

LASER RADAR WIRE DETECTION

Charles E. Nourrcier, Lakewood, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 11, 1991, Ser. No. 774,914
Int. Cl.[5] G01C *3/08*
U.S. Cl. 356—5 **13 Claims**



1. A laser radar detection system which discriminates between unresolved and resolved detected objects, said system comprising:

a laser radar sensor for transmitting an optical scanning transmit signal within a desired field and receiving reflected signals from objects located therein;

said laser radar sensor including a photo mixer for receiving both said reflected signals and a local oscillator (LO) signal derived from said transmit signal and providing the difference therebetween as an output signal; and

processing means for receiving the output signal of said photo mixer and discriminating between resolved and unresolved signals detected therein said processing means comprising;

fourier transform means for providing an unweighted fourier transform of the received signal to thereby provide a power spectrum in the frequency domain; and

signal processing means for determining whether the power spectrum of said signal contains side lobes representing clutter or does not contain side lobes representing an unresolved object.

5,151,748

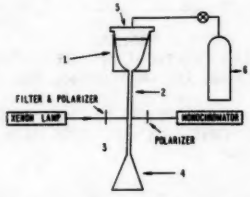
OPTICAL SENSOR FOR THE MEASUREMENT OF MOLECULAR ORIENTATION AND VISCOSITY OF POLYMERIC MATERIALS BASED ON FLUORESCENCE RADIATION

Anthony J. Bur, Rockville, Md.; Robert E. Lowry, Falls Church, Va.; Steven C. Roth, Frederick, Md.; Charles L. Thomas, Philadelphia, Pa., and Francis W. Wang, Gaithersburg, Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Aug. 7, 1990, Ser. No. 563,762

Int. Cl.[5] G01N *21/64*

U.S. Cl. 356—32 **7 Claims**



1. A method for measuring fluid properties of a polymer melt undergoing shear or extensional flow which comprises:

incorporating a chromophore into the matrix of a polymer so that said chromophore is responsive to changes in the molecular orientation of said polymer, said chromophore comprises a polymeric chromophore having a polymer backbone and a chromophore bonded to said polymer backbone;

exposing said polymer to fluorescent excitation while subjecting said polymer to shear or extension stress;

detecting fluorescent emission spectra which results from said fluorescent excitation and;

analyzing said fluorescent emission spectra to determine fluid properties of said polymer.

5,151,749

METHOD OF AND APPARATUS FOR MEASURING COORDINATE POSITION AND POSITIONING AN OBJECT

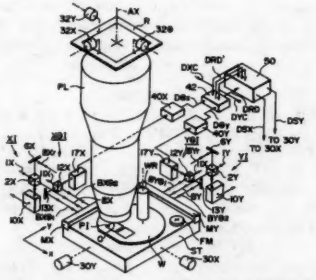
Akikazu Tanimoto, and Saburo Kamiya, both of Yokohama, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 529,662, May 29, 1990, abandoned. This application May 28, 1991, Ser. No. 707,925

Claims priority, application Japan, Jun. 8, 1989, 1-145733

Int. Cl.[5] G01B *11/00*

U.S. Cl. 356—375 **6 Claims**



1. A method of measuring a position of a stage moved in a predetermined direction, the stage having a first plane mirror extending in said predetermined direction and a second plane mirror extending in a direction perpendicular to the predetermined direction, comprising the steps of:

(a) measuring a change in the distances to a reflecting surface of said first plane mirror in a direction perpendicular to the reflecting surface by a light wave interferometer;

(b) substantially simultaneously measuring local curving deviations of reflecting surface of said first and second plane mirrors, respectively, and

(c) correcting the position of the stage measured with the light wave interferometer on the basis of the measured values of said curving deviations.

5,151,750

ALIGNMENT APPARATUS

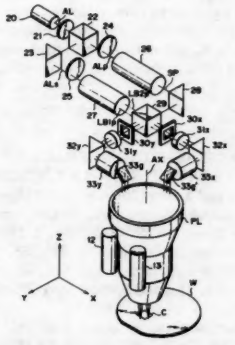
Nobutaka Magome, Kawasaki; Kazuya Ota, Tokyo; Hideo Mizutani, Yokohama, and Kouichiro Komatsu, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Apr. 6, 1990, Ser. No. 505,504

Claims priority, application Japan, Apr. 14, 1989, 1-94965; Apr. 25, 1989, 1-105198

Int. Cl.[5] G01B *11/00*

U.S. Cl. 356—401 **13 Claims**



1. An apparatus for relative alignment of a first object and a second object, comprising:

an objective optical system having a first side at which said first object is disposed and a second side at which said second object is disposed, and being telecentric at least at said second side;

an illuminating system for providing a first coherent light beam passing through a predetermined area of a pupil plane of said objective optical system, and a pair of second coherent light beams passing through two areas substantially point symmetrical with respect to said predetermined area of the pupil plane;

light receiving means for receiving optical information generated by an alignment mark formed on said second object, through said objective optical system and generating a corresponding output;

switch means for selectively supplying said objective optical system with said first light beam or said second light beams; and

means for causing relative movement of said first and second objects in response to the output of said light receiving means.

5,151,751

METHOD FOR EVALUATING COLOR TONE OF COATING FILM AND DEVICE FOR THIS EVALUATION

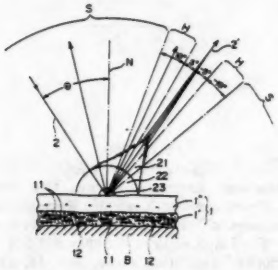
Takashi Nakajima, deceased, late of Ashiya by Satoko Nakajima, legal representative , and Misao Morita, Kobe, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jul. 18, 1990, Ser. No. 553,823

Claims priority, application Japan, Jul. 19, 1989, 1-186699

Int. Cl.[5] G01J *3/46;* **G01N** *21/25, 21/27*

U.S. Cl. 356—402 **2 Claims**



1. A method for evaluation of a color tone of a coating film, comprising the steps of projecting a luminous flux on a coating film, obtaining light reflected from said coating film; the reflected light including a regularly reflected luminous flux, obtaining a high light excitation purity of the coating film on a basis of a high light part of the reflected light which is at an angle of about 10° against the regularly reflected luminous flux in the reflected light, and deriving a transparency feeling and a deepness feeling of the coating film from said high light excitation purity.

5,151,752

METHOD OF MEASURING REFRACTIVE INDICES OF LENS AND SAMPLE LIQUID

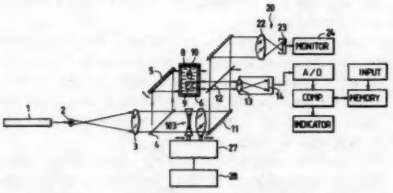
Masahiro Oono, and Tohru Chiba, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 609,845, Nov. 7, 1990, abandoned, which is a continuation of Ser. No. 519,355, May 8, 1990, abandoned, which is a continuation of Ser. No. 367,290, Jun. 16, 1989, abandoned. This application May 28, 1991, Ser. No. 707,438

Claims priority, application Japan, Jun. 16, 1988, 63-149831; Jun. 27, 1988, 63-158992; Jun. 27, 1988, 63-158993; Jul. 1, 1988, 63-165210; Jul. 1, 1988, 63-165211

Int. Cl.[5] G01B *9/00, 11/00*

U.S. Cl. 356—128 **39 Claims**



1. A method of measuring a refractive index distribution of a lens, comprising the following steps: immersing a glass sample and a lens under test within a matching fluid whose refractive index differs slightly from that of the lens to be tested, said glass sample having a refractive index and a shape which are both known and said lens to be tested having an unknown refractive index but a known shape; allowing coherent light to pass through said glass sample and said lens under test; superposing the transmitted light wave on a reference light wave to generate interference fringes; outputting the intensity distribution of interference fringes that are generated by the light wave that has passed through said glass sample; determining the refractive index of said matching fluid on the basis of the resulting output; outputting the intensity distribution of interference fringes that are generated by the light wave that has passed through said lens under test; separating from the resulting output the defocus term and aberration terms in the polynomial which expresses the produced interference fringes; determining the average refractive index of said lens under test from the separated defocus term and the refractive index of the matching fluid; and determining the refractive index distribution of said lens under test from said aberrations terms.

5,151,753

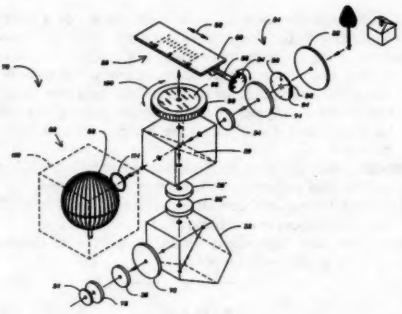
NON-PARALLAX OPTICAL SIGHTING INSTRUMENT

Hobart A. Whitman, III, 149 Westwood Rd., Asheville, N.C. 28804

Filed Oct. 10, 1990, Ser. No. 595,182

Int. Cl.[5] G01C *1/06, 9/32, 17/08;* **B23B** *45/14*

U.S. Cl. 356—142 **17 Claims**



1. An optical sighting instrument comprising:

a main optical path including an objective lens and an eyepiece lens;

a beamsplitter positioned within said main optical path;

at least three image planes being defined with reference to said main optical path and said beamsplitter, at least one of said image planes being optically superimposed with the others of said image planes by said beamsplitter; and

a pair of moveable indicia elements respectively positioned in two of said image planes, and a fixed indicia element positioned in the third of said image planes such that images of all three of said indicia elements are superimposed for viewing through said eyepiece lens, the image of said fixed indicia element serving as a sighting reference.

5,151,754

METHOD AND AN APPARATUS FOR MEASURING A DISPLACEMENT BETWEEN TWO OBJECTS AND A METHOD AND AN APPARATUS FOR MEASURING A GAP DISTANCE BETWEEN TWO OBJECTS

Yoriyuki Ishibashi, Kawasaki; Ryoichi Hirano, Tokyo, and Jun Nishida, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 5, 1990, Ser. No. 593,871

Claims priority, application Japan, Oct. 6, 1989, 1-261568; Feb. 5, 1990, 2-25836

Int. Cl.[5] G01B *11/02*

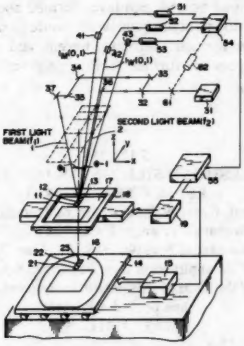
U.S. Cl. 356—356 **33 Claims**

1. A method for measuring a displacement between first and second objects facing each other with respect to a direction perpendicular to the direction in which the objects face each

other, said first object having at least first and second regions, said second object having at least first and second regions which correspond to the first and second regions of the first object, respectively, said first object having a transmitting surface at least in the first region thereof and a diffraction grating at least in the second region thereof, said second object having a diffraction grating at least in the first region thereof, said diffraction gratings of the first and second objects changing a light beam, which is emitted after being transferred to corresponding regions of the first and second objects, into two-dimensionally distributed diffracted light beams, said method comprising the steps of:

emitting a first light beam having a frequency f1 and a second light beam having a frequency f2 ($f2 \neq f2$) from light source means, which is arranged so as to face the second object, with the first object located between said light source means and said second object;

transferring the first and second light beams to the first and second regions of the first object, and then causing the first and second light beams to be diffracted and interfere



with each other in corresponding regions of the first and second objects, thereby to emit at least two two-dimensionally distributed, diffracted interference light beams, said two diffracted interference light beams including a first diffracted interference light beam which is diffracted only in the first region of the second object, and a second diffracted interference light beam which is diffracted at least in the second region of the first object;

detecting a light beam of a specific order from the first diffracted interference light beam and converting the detected light beam into a first beat signal having a frequency of Δf, where $\Delta f = |f1 - f2|$, and further detecting a light beam of an order identical with or different from said specific order, from the second diffracted interference light beam and converting the detected light beam into a second beat signal having said frequency (Δf); and

calculating a phase difference between the first and second beat signals and deriving the displacement between the first and second objects from the calculated phase difference.

5,151,755

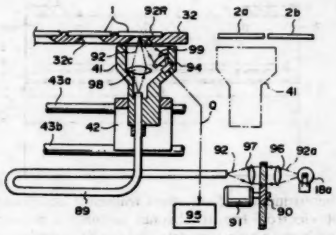
METHOD FOR DETECTING DEFECTS IN MEASUREMENT MEANS OF BIOCHEMICAL ANALYSIS APPARATUSES

Shunichi Seto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 16, 1990, Ser. No. 567,569
Claims priority, application Japan, Aug. 16, 1989, 1-211085
Int. Cl.[5] G01N *21/25*
U.S. Cl. 356—414 **13 Claims**

1. A method for detecting defects in a measurement means of a biochemical analysis apparatus wherein a droplet of liquid sample is applied to an analysis medium containing a reagent, which chemically reacts with a specific constituent in the liquid sample, the analysis medium is then incubated, the optical densities of the analysis medium are determined, and concentrations of the specific constituent in the liquid sample are determined from the optical densities of the analysis medium thus determined,

the method for detecting defects in the measurement means of the biochemical analysis apparatus comprising the steps of:



(a) irradiating light, which has passed through a plurality of interference filters by turns, to a reference density plate at predetermined time intervals,

(b) measuring amounts of light reflected by said reference density plate,

(c) comparing a set of the amounts of light reflected, which have thus been measured, with one another, and

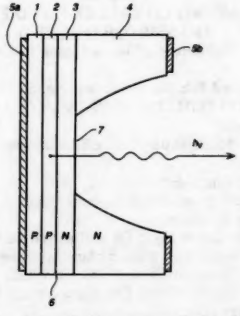
(d) detecting defects in the measurement means from the results of the comparison.

5,151,756

SURFACE EMITTING HETEROJUNCTION LIGHT EMITTING DIODE

Hans K. Nettelbladt, Bromma, and Karl M. Widman, Kungsängen, both of Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

Filed Jul. 18, 1991, Ser. No. 731,776
Claims priority, application Sweden, May 8, 1991, 9101395
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 **11 Claims**



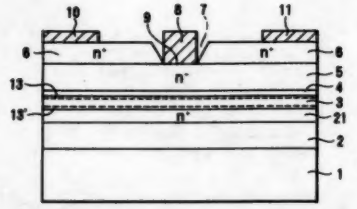
1. A surface emitting light emitting diode with at least one PN junction between two semiconductor layers, at least one of which is active, said diode being adapted to emit light through a predetermined exit surface wherein the diode further comprises at least one additional layer, a luminescence layer, which is made of a material with a narrower energy gap than that of the active layer and is arranged between the active layer and the exit surface.

5,151,757

HETEROJUNCTION FIELD-EFFECT TRANSISTOR

Takatomo Enoki; Naoteru Shigekawa, and Kunihiro Arai, all of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Oct. 24, 1991, Ser. No. 781,851
Claims priority, application Japan, Oct. 26, 1990, 2-290187
Int. Cl.[5] H01L *29/80*
U.S. Cl. 357—22 9 Claims



1. A heterojunction field-effect transistor comprising:
a first electron transit channel formation semiconductor layer formed on a substrate and consisting of a compound semiconductor;
a first electron supply semiconductor layer formed on said first electron transit channel formation semiconductor layer and consisting of a compound semiconductor;
a gate electrode, a source electrode, and a drain electrode formed on said first electron supply semiconductor layer; and
a second electron transit channel formation semiconductor layer formed between said substrate and said first electron transit channel formation semiconductor layer,
wherein said second electron transit channel formation semiconductor layer consists of a compound semiconductor which has electron affinity smaller than that of said first electron transit channel formation semiconductor layer and larger than that of said first electron supply semiconductor layer, and is different from said first electron transit channel formation semiconductor layer in field strength position where a maximum value of an electron velocity is obtained, and is arranged such that an energy level on a bottom of an electron conduction band of said second electron transit channel formation semiconductor layer is substantially the same as a Fermi level.

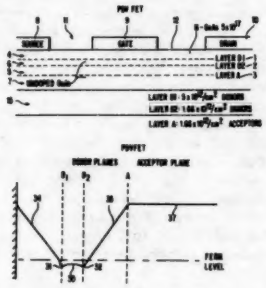
5,151,758

PLANAR-DOPED VALLEY FIELD EFFECT TRANSISTOR (PDVFET)

Thane Smith, Middletown, Md., assignor to Comsat, Clarksburg, Md.

Filed Feb. 20, 1991, Ser. No. 657,918
Int. Cl.[5] H01L *29/161, 29/20, 21/203, 21/20*
U.S. Cl. 357—22 12 Claims

1. A planar doped valley field effect transistor device, comprising:
a semi-insulating substrate;
a first doped or undoped layer formed above said semi-insulating substrate;
a first atomic plane layer formed above said first doped or undoped layer, said atomic plane layer being doped with donor or acceptor atoms, wherein said first doped or undoped layer and said first atomic plane layer constitute a first layer pair;
at least one additional layer pair, including an additional doped or undoped layer and an additional atomic plane layer, formed above said first layer pair, wherein said doped, undoped and atomic plane layers interact to create a potential well of a desired shape within an energy band diagram of said planar doped semiconductor in order for a two dimensional electron gas to exist therein, said energy band diagram having a wide conduction band wherein said potential well represents a portion of the conduction band which lies below a Fermi level and includes said first and additional atomic plane layers and any doped and undoped layers therebetween; and



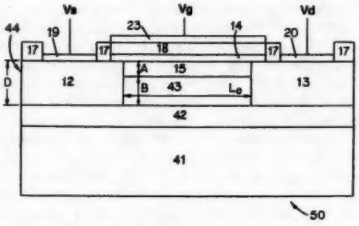
an upper doped or undoped layer formed above said at least one additional layer pair with source, drain, and gate electrodes formed thereon wherein said doped and undoped layers are formed from a single-crystalline homostructure.

5,151,759

FERMI THRESHOLD SILICON-ON-INSULATOR FIELD EFFECT TRANSISTOR

Albert W. Vinal, Cary, N.C., assignor to Thunderbird Technologies, Inc., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 318,153, Mar. 2, 1989, Pat. No. 4,990,974. This application Jan. 25, 1991, Ser. No. 646,829
The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.3 39 Claims



1. A field effect transistor comprising:
a thin semiconductor layer having a first surface and a second surface opposite said first surface;
source and drain regions of first conductivity type in said thin semiconductor layer;
a channel substrate of second conductivity type, in said thin semiconductor layer at said second surface, between said source and drain regions;
a channel of said first conductivity type in said thin semiconductor layer at said first surface, between said source and drain regions, said channel having a predetermined depth from said first surface;
a gate insulating layer on said thin semiconductor layer at said first surface adjacent said channel, at least one of the source doping, source depth, drain doping, drain depth, channel substrate doping, channel substrate depth, channel doping and channel depth being selected to produce zero static electric field perpendicular to said first surface

at said first surface between said channel and said gate insulating layer; and

source, drain and gate contacts for electrically contacting said source and drain regions and said gate insulating layer, respectively.

5,151,760

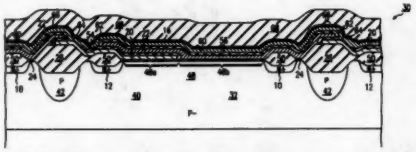
INTEGRATED CIRCUIT WITH IMPROVED CAPACITIVE COUPLING

Manzur Gill, Rosharon, and David J. McElroy, Lubbock, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 563,369, Aug. 6, 1990, Pat. No. 5,057,446. This application Jul. 30, 1991, Ser. No. 738,004

Int. Cl.[5] H01L *29/68, 27/02*

U.S. Cl. 357—23.5 **25 Claims**



1. A memory cell, formed at a face of a semiconductor layer of a first conductivity type, comprising:

a source region of a second conductivity type opposite that of said first conductivity type, formed at said face;

a drain region of said second conductivity type formed at said face and spaced from said source region by a channel area;

a merged pass gate conductor extending over a portion of said channel area;

a floating gate conductor, a first portion of said floating gate conductor insulatively adjacent a portion of said merged pass gate conductor, a second portion of said floating gate conductor insulatively adjacent a portion of said channel area;

a control gate conductor, said control gate conductor contacting said merged pass gate conductor and disposed insulatively adjacent said floating gate conductor;

first insulator regions overlying said respective source and drain regions; and

second insulator regions adjacent said source and drain regions, said second insulator regions remote from said channel area, said merged pass gate conductor extending over said first insulator region overlying said drain region and over a portion of said second insulator region adjacent said drain region.

5,151,761

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE WITH ISOLATED GATE ELECTRODES

Masataka Takebuchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 14, 1990, Ser. No. 627,846

Claims priority, application Japan, Dec. 15, 1989, 1-325395

Int. Cl.[5] H01L *29/68, 23/48, 29/46*

U.S. Cl. 357—23.5 **28 Claims**

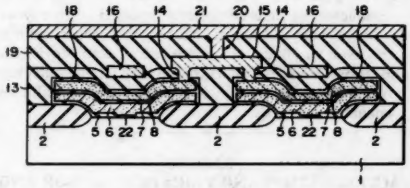
1. A nonvolatile semiconductor memory device comprising:

a semiconductor substrate;

a field oxidation film selectively formed on said semiconductor substrate;

a first gate insulating film formed on an exposed surface of said semiconductor substrate and on said field oxidation film, and

a plurality of memory cells formed on said first gate insulating film; wherein each of said plurality of memory cells includes said first gate insulating film, a floating gate electrode, a second gate insulating film, and a control gate electrode, and said floating gate electrode and said control gate electrode of each of said plurality of memory cells are



isolated from the floating gate electrodes and control gate electrodes of adjacent memory cells, respectively, so as to be formed into islands.

5,151,762

SEMICONDUCTOR DEVICE, FABRICATING METHOD THEREOF AND FLASH CONTROL DEVICE USING THE SEMICONDUCTOR DEVICE

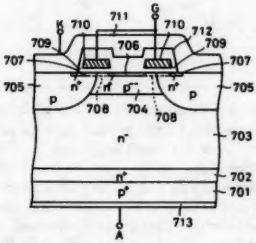
Akio Uenishi; Hiroshi Yamaguchi, and Yasuaki Fukumochi, all of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1991, Ser. No. 663,431

Claims priority, application Japan, Apr. 12, 1990, 2-98021; Apr. 26, 1990, 2-111119; Nov. 2, 1990, 2-298668

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.4 **11 Claims**



1. A semiconductor device, comprising:

a first conductivity type first semiconductor layer having first and second major surfaces;

a second conductivity type second semiconductor layer formed on said first major surface of said first semiconductor layer;

a first conductivity type first semiconductor region of first impurity concentration selectively formed in a surface of said second semiconductor layer;

a first conductivity type second semiconductor region of second impurity concentration higher than said first impurity concentration selectively formed in the surface of said second semiconductor layer adjacently to said first semiconductor region;

a second conductivity type third semiconductor region formed in at least a portion of a surface of said first semiconductor region;

a second conductivity type fourth semiconductor region selectively formed in a surface of said second semiconductor region at a distance from said first semiconductor region,

surface portions of said first and second semiconductor regions between said third and fourth semiconductor regions being defined as a channel;

a gate insulation film formed on said channel;

a gate electrode formed on said gate insulation film;

a first main electrode formed to spread on said second and fourth semiconductor regions; and

a second main electrode formed on said second major surface of said first semiconductor layer, wherein

said first impurity concentration is so set that said first semiconductor region is completely depleted when a working voltage is applied across said first and second main electrodes in an off state of said semiconductor device, and

said second impurity concentration is so set that said channel has a threshold voltage of a predetermined value in an enhancement mode.

5,151,763

ACCELERATION AND VIBRATION SENSOR AND METHOD OF MAKING THE SAME

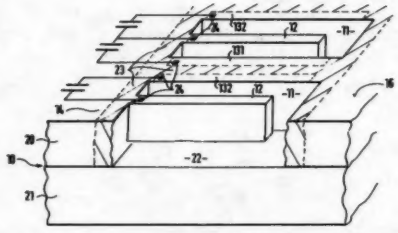
Jiri Marek, Reutlingen; Frank Bantien, Ditzingen; Dietmar Haack, Reutlingen, and Martin Warth, Schwaikhein, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 21, 1990, Ser. No. 631,623

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1990, 4000903

Int. Cl.[5] H01L *29/84, 29/96*

U.S. Cl. 357—26 **10 Claims**



1. A sensor for measurement of vibration or acceleration which is manufactured from a base plate of monocrystalline semiconductive material consisting of silicon containing minor amounts of other elements for affecting the conductivity types (p or n) of the material and having at least one tongue (12) etched out of said base plate and means for evaluating a deflection of said at least one tongue, characterized

in that said base plate comprises an upper layer (20) and a lower layer (21) which on account of n-type or p-type doping of said lower layer provides a pn junction in the case of said n-type doping or an np junction in the case of said p-type doping at its junction with said lower layer (21);

in that said at least one tongue has major sides perpendicular to a face surface of said base plate, has at least one major side facing, across a gap, a surface of said at least one electrode, has a firm root end which is integral with said base plate and has a free end longitudinally opposite to said root end, said electrode surface facing said tongue being perpendicular to a face surface of said base plate, said at least one tongue (12) and said at least one electrode (13) being formed entirely in said upper layer (20);

in that the surfaces respectively of said at least one tongue and of said at least one electrode are of said material consisting of silicon containing minor amounts of other elements;

in that said at least one tongue (12) and said at least one electrode (13) are insulated from each other by etched channels which extend in depth completely through said upper layer (20), and

in that, by virtue of electrical connections to said at least one tongue and said at least one electrode, a capacitance change between said at least one tongue and said at least one electrode is measurable, whereby the deflection of said tongue by vibration or acceleration of said base plate is measurable.

5,151,764

SEMICONDUCTOR DEVICE

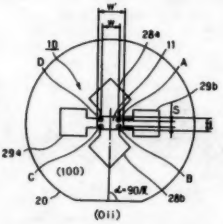
Yasutoshi Suzuki, Okazaki; Namoi Awano, Nagoya; Kouichi Hoshino, Oobu, and Hajime Inuzuka, Nishio, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 4, 1990, Ser. No. 592,487

Claims priority, application Japan, Oct. 5, 1989, 1-260991

Int. Cl.[5] H01L *27/27, 29/82, 29/96, 43/00*

U.S. Cl. 357—27 **13 Claims**



1. A semiconductor device for detecting a strength of a magnetic field, comprising:

a semiconductor wafer;

an active layer of a Group III and V element compound semiconductor formed on said semiconductor wafer, said active layer comprising:

a) a first pair of convex portions of a generally convex shape, a first convex portion of said first pair being opposite to a second convex portion thereof and connected thereto at a connection portion;

b) a second pair of convex portions of a generally convex shape, a third convex portion of said second pair being opposite to a fourth convex portion thereof and connected thereto at a connection portion, said first and second pairs arranged so that said first pair of convex portions crosses said second pair of convex portions; and

c) a crossing portion having a same crystalline surface thereof exposed at all points where said first pair of convex portions crosses said second pair of convex portions;

a pair of input terminals each of which is electrically connected to each convex portion of said first pair and adapted to input electric current to said each convex portion of said first pair; and

a pair of output terminals each of which is electrically connected to each convex portion of said second pair and connected to output a voltage generated in said active layer in response to a magnetic field strength,

wherein said first pair of convex portions and said second pair of convex portions are formed so that a ratio of a width of said connection portion of said second pair to a length of said connection portion of said first pair is equal to or less than 0.23.

5,151,765

SEMICONDUCTOR DEVICE COMPRISING HIGH-SPEED AND HIGH-CURRENT TRANSISTORS FORMED IN A COMMON SUBSTRATE AND HAVING MATCHED CHARACTERISTICS

Tunenori Yamauchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 354,839, May 22, 1989, abandoned. This application Apr. 10, 1991, Ser. No. 685,153

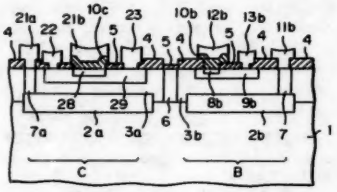
Claims priority, application Japan, May 20, 1988, 63-124117

Int. Cl.[5] H01L *29/72, 27/02*

U.S. Cl. 357—34 **12 Claims**

1. A semiconductor device formed in a common semicon-

ductor substrate, the substrate having an upper, main surface, comprising: a first bipolar transistor having a first, wide emitter width and a second bipolar transistor have a second, narrow emitter width relatively to the first, wide emitter width, the first and second transistors being formed in the common semiconductor substrate and respectively having first and second, emitter, base and collector regions, at successively lower positions within the substrate and relatively to the upper, main surface of the substrate, defining corresponding base-emitter and basecollector junctions with an associated active base region between the junctions, the first and second active base regions of the first and second transistors having respective thickness dimensions in a direction transverse to the upper,



main surface of the substrate, and the respective impurity concentrations int he base regions of the first and second transistor being selected so as to afford substantially equivalent, total amounts of impurities in the respective first and second active base regions and, correspondingly, balanced static emitter current gains h_{FE} of the respective first and second transistors, and first an second patterned portions of a layer of impurity-doped polycrystalline silicon having ion-implanted impurities therein formed on the upper, main surface of the substrate in correspondence to the first and second emitter regions, respectively, and functioning as respective first and second impurity diffusion sources from which impurities are diffused into the substrate thereby forming and defining the respective first and second emitter regions.

5,151,766

SEMICONDUCTOR COMPONENT

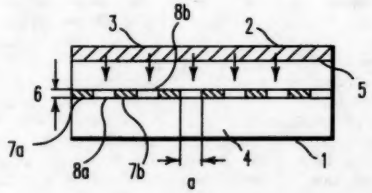
Marcel Hüppi, Zürich, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Continuation of Ser. No. 520,813, May 9, 1990, abandoned. This application Jun. 11, 1991, Ser. No. 713,018

Claims priority, application Switzerland, May 18, 1989, 1861/89

Int. Cl.[5] H01L *29/74*

U.S. Cl. 357—38 **5 Claims**



1. A semiconductor element having a current direction that can switch from a conducting into a non-conducting state, comprising

(a) a doped zone having minority charge carriers, which in the non-conducting state have a given mean bulk lifetime Tau_{SRH} and thus a mean bulk diffusion length $LD_{,Bulk}$ and in the conducting state, in which the doped zone is swamped by minority charge carriers in an axial direction parallel to the current direction, having a shortened lifetime Tau_{Aug} by virtue of the Auger recombination, and

(b) a region limited in said axial direction, located at a given depth in the doped zone, in which region there is a pulse shaped concentration profile of recombination centers for reducing the mean bulk lifetime Tau_{SRH} of the minority charge carriers; said axially limited region having a length in the axial direction which is smaller or equal to the length of said doped zone; wherein

(c) the recombination centers form a trap density profile varying periodically transverse to said axial direction, in which segments of low trap density alternate with segments of high trap density with a period corresponding approximately to the bulk diffusion length $L_{D,Bulk}$.

5,151,767

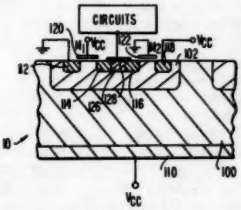
POWER INTEGRATED CIRCUIT HAVING REVERSE-VOLTAGE PROTECTION

Stephen L. Wong, Scarsdale, N.Y., assignor to North American Philips Corp., New York, N.Y.

Filed May 3, 1991, Ser. No. 695,490

Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—43 **6 Claims**



1. A power integrated circuit having a substrate of a first conductivity type, a first, surface-adjoining well of a second conductivity type opposite to the first, at least one low-power circuit being provided in said first well, a second, surface-adjoining well of said second conductivity type and spaced apart from aid first well, at least one power transistor being provided at least partly in said second well, characterized in that said power integrated circuit comprises a reverse-voltage protection circuit, which comprises:

a p-n junction for coupling said first well to a first power supply terminal, said p-n junction and a further p-n junction between said first well and said substrate together forming a bipolar transistor having a base region and two main regions defining a major current path, said substrate being coupled to a second power supply terminal;

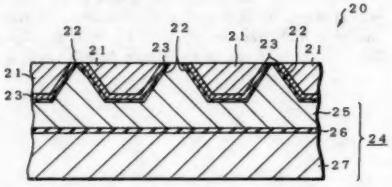
a first MOS transistor in said first well and having a main current path coupled between said base region and a first of said two main regions of said bipolar transistor, and a gate terminal coupled to said second power supply terminal; and

a second MOS transistor in said first well and having a main current path coupled between said base region and a second of said two main regions of said bipolar transistor, and a gate terminal coupled to said first power supply terminal.

5,151,768
DIELECTRIC ISOLATION SUBSTRATE

Tsuyoshi Aso, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 657,823, Feb. 20, 1991, abandoned. This application Mar. 6, 1992, Ser. No. 845,785
Claims priority, application Japan, Feb. 22, 1990, 2-39786
Int. Cl.[5] H01L 27/02
U.S. Cl. 357—51 11 Claims



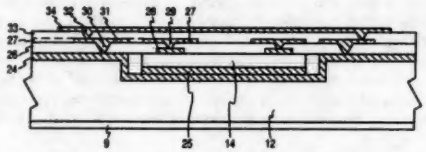
1. A dielectric isolation substrate comprising:
a plurality of single crystal semiconductor islands having surfaces substantially lying in a common plane;
a plurality of first insulating layers respectively underlying said semiconductor islands, said semiconductor islands being electrically isolated from each other by said first insulating layers; and
a supporting structure having a capacitor therein, said supporting structure including,
(a) a first conductive layer supporting and electrically isolated from said semiconductor islands, the first conductive layer having a first surface and an opposite second surface, the first surface having a flat region substantially lying in the common plane and a concave region underlying said first insulating layers, the first conductive layer constituting a first electrode of the capacitor and being electrically connected to a first potential,
(b) a second insulating layer having a first surface and an opposite second surface, the first surface of the second insulating layer formed on the second surface of the first conductive layer, the second insulating layer constituting a dielectric layer of the capacitor, and
(c) a second conductive layer formed on the second surface of the second insulating layer, the second conductive layer constituting a second electrode of the capacitor and being electrically connected to a second potential.

5,151,769
OPTICALLY PATTERNED RF SHIELD FOR AN INTEGRATED CIRCUIT CHIP FOR ANALOG AND/OR DIGITAL OPERATION AT MICROWAVE FREQUENCIES

Anthony A. Immorlica, Jr., Manlius, and Robert F. Chase, Fayetteville, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Apr. 4, 1991, Ser. No. 680,376
Int. Cl.[5] H01L 29/40, 23/02, 23/16, 25/04
U.S. Cl. 357—53 7 Claims

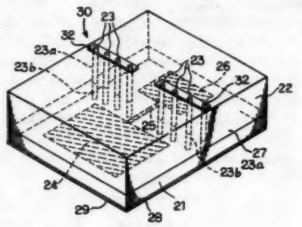
3. In combination,
(A) an integrated circuit chip for analog and/or digital operation at microwave frequencies,
(B) a substrate, a portion of which has a recess for supporting said integrated circuit chip with the upper surface flush with the substrate surface,
(C) an optically patterned RF shield enclosing said chip,
(1) the bottom and a part of the sides comprising a first metallization covering the interior of the recess and the upper surface of said substrate adjacent said recess, and
(2) another part of the sides comprising a first optically patterned dielectric layer having a first set of local perforations spaced along a line bounding said chip, and an optically patterned second metallization bonded to said first dielectric layer, to provide electrically conductive paths via said first set of perforations to said first metallization, the spacing between perforations being adequately small to prevent passage of RF waves at frequencies of interest.



5,151,770
SHIELDED SEMICONDUCTOR DEVICE

Akira Inoue, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1990, Ser. No. 616,366
Claims priority, application Japan, Nov. 24, 1989, 1-305125
Int. Cl.[5] H01L 29/40, 23/48, 29/46, 25/04
U.S. Cl. 357—53 9 Claims



9. A semiconductor device comprising:
a substrate,
at least two integrated circuits adapted for operation at high frequency formed on a planar surface of the substrate, the integrated circuits being disposed such that electromagnetic radiation can be transmitted between the integrated circuits through a coupling region above the planar surface and cause electromagnetic coupling of the integrated circuits,
an insulator film on the substrate, the insulator film overlying the integrated circuits and extending in the direction normal to the planar surface of the substrate to a substantial height above the planar surface, the insulator film being disposed in the coupling region,
an array of pin-like conductors disposed along a shielding line between the integrated circuits, the pin-like conductors being embedded in and supported above the planar surface of the substrate in the coupling region by the insulator film, the pin-like conductors being oriented in a direction substantially normal to the surface of the substrate so as to be in intersect paths for transmission of electromagnetic radiation in the coupling region between the two integrated circuits, the pin-like conductors having a spacing between pins which is substantially less than the wavelength of the operating frequency of the integrated circuits, and extending into the coupling region to a height above the planar surface adapted to block the electromagnetic transmission between the integrated circuits, and
means for applying an effective ground to the pin-like con-

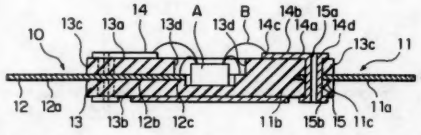
ductors for providing an electromagnetic shield between the integrated circuits.

5,151,771

HIGH LEAD COUNT CIRCUIT BOARD FOR CONNECTING ELECTRONIC COMPONENTS TO AN EXTERNAL CIRCUIT

Atsushi Hiroi; Mitsuhiro Kondo, and Kinya Ohshima, all of Oogaki, Japan, assignors to Ibiden Co., Ltd, Japan

Filed Jan. 28, 1991, Ser. No. 646,355
Claims priority, application Japan, May 31, 1990, 2-143977
Int. Cl.[5] H01L *23/48, 29/44*
U.S. Cl. 357—70 12 Claims



1. A circuit board for mounting an electronic component, the circuit board comprising:

an electrically insulating substrate having a first and a second major surfaces, an outer peripheral side surface, and a recess formed in said first major surface for mounting the electronic component therein;

a plurality of leads including a plurality of first leads disposed in said substrate in a substantially side-by-side relationship with a space therebetween and a plurality of second leads disposed between said first leads with a space therebetween, said first leads each having an outer end outwardly extending from said outer peripheral side surface of said substrate and an inner end within said substrate, and said second leads each having an outer end outwardly extending from said outer peripheral side surface of said substrate and an inner end exposed within said recess for electrical connection to said electronic component;

a plurality of first conductors, each attached to said first major surface of said substrate and having an outer end and an inner end disposed in the vicinity of said recess for electrical connection to said electronic component; and

a plurality of through-hole conductors, each extending through said substrate and electrically connected between said inner end of one of said first leads and said outer end of one of said first conductors.

5,151,772

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Yasushi Takahashi, Tachikawa; Hiromi Matsuura, Tokorozawa; Yoshihisa Koyama, Akishima; Masaya Muranaka, Akishima; Katsutaka Kimura, Akishima; Kazuyuki Miyazawa, Iruma; Masamichi Ishihara, Hamura, and Hidetoshi Iwai, Ohme, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi VLSI Engineering Corp., Kodaira, both of, Japan

Continuation of Ser. No. 243,607, Sep. 13, 1988, abandoned. This application Nov. 20, 1990, Ser. No. 616,705
Claims priority, application Japan, Sep. 19, 1987, 62-235901; Dec. 18, 1987, 62-320936
Int. Cl.[5] H01L *23/48, 29/46, 29/54, 29/04*
U.S. Cl. 357—71 32 Claims

1. A semiconductor integrated circuit device comprising:

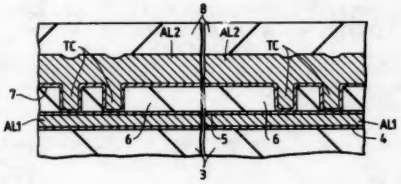
(a) a memory cell array including a plurality of memory cells on a rectangular semiconductor substrate having a pair of opposing longer sides and a pair of opposing shorter sides;

(b) a first peripheral circuit adjacent one of said shorter sides and a second peripheral circuit adjacent the other of said shorter sides on said semiconductor substrate, wherein said memory cell array is located between said first and second peripheral circuits;

(c) an external terminal to be supplied with a predetermined signal other than a power supply signal, said external terminal being located on said semiconductor substrate;

(d) a first wiring coupling said external terminal to said first peripheral circuit to provide said predetermined signal to said first peripheral circuit, wherein said first peripheral circuit includes means for producing a predetermined output signal in response to said predetermined signal;

(e) a second wiring coupling said first peripheral circuit to said second peripheral circuit for providing said predetermined output signal of said first peripheral circuit to said second peripheral circuit, wherein said second wiring is located at a region of said substrate other than said memory cell array and extends along one of said longer sides in a peripheral area of said semiconductor substrate between said memory cell array and said one of said longer sides, and



(f) a third and a fourth wiring formed on both sides of said second wiring and extending along said second wiring,

wherein said second wiring comprises a first conductive layer and a second conductive layer on said first conductive layer, said first and second conductive layers being electrically coupled to each other to provide a reduced resistance to said second wiring along said one of said longer sides of the substrate between said first and second peripheral circuits, and

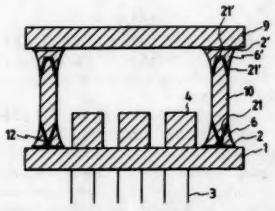
further wherein said third and fourth wirings are single-layer wirings each comprised either of said first conductive layer or said second conductive layer.

5,151,773

ELECTRONIC CIRCUIT APPARATUS COMPRISING A STRUCTURE FOR SEALING AN ELECTRONIC CIRCUIT

Kiyoshi Matsui; Ryohei Satoh, both of Yokohama; Toshitada Netsu, Hatano; Hideaki Sasaki, Hatano; Mitugu Shirai, Hatano, and Kenichi Hamamura, Hatano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 28, 1991, Ser. No. 676,389
Claims priority, application Japan, Mar. 30, 1990, 2-80712
Int. Cl.[5] H01L *23/02, 23/12, 39/02*
U.S. Cl. 357—74 3 Claims



1. An electronic circuit apparatus comprising a substrate, electronic circuit components mounted on said substrate, and a sealing unit for sealing said electronic components on said substrate, said electronic circuit apparatus further comprising:

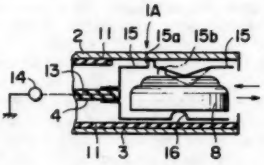
a first solder joint portion;
a frame-like first sealing unit connected to said substrate by said first solder joint portion;
a second solder joint portion; and
a second sealing unit connected to said first sealing unit by said second solder joint portion, to enclose said electronic circuit components,
wherein said first sealing unit has at least one shaped end, and
wherein said first solder joint portion includes a first maintaining member for maintaining a predetermined space between said substrate and said first sealing unit, and said second solder joint includes a second maintaining member for maintaining said predetermined space between first sealing unit and said second sealing unit.

5,151,774

PORTABLE SEMICONDUCTOR DATA STORAGE DEVICE WITH DISCONNECTABLE GROUND CONNECTION

Yoshihide Mori, Kawanishi, and Takayuki Shinohara, Itami, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 18, 1991, Ser. No. 687,062
Claims priority, application Japan, Oct. 31, 1990, 2-291919
Int. Cl.[5] H01L *23/42, 23/44*
U.S. Cl. 357—79 **4 Claims**



1. A portable semiconductor data storage device comprising:
a board on which semiconductor devices are mounted and including a circuit ground;
a pair of conductive outer plates disposed on opposite sides of said board;
means electrically connecting said conductive outer plates to each other; and
first and second terminal members for respectively contacting positive and negative polarity terminals of a cell inserted into said device, said first terminal electrically connecting a first of the positive and negative polarity terminals of a cell to said conductive outer plates and the circuit ground when the cell is disposed between said first and second terminal members, said conductive outer plates being electrically disconnected from the circuit ground when the cell is not disposed between said first and second terminal members.

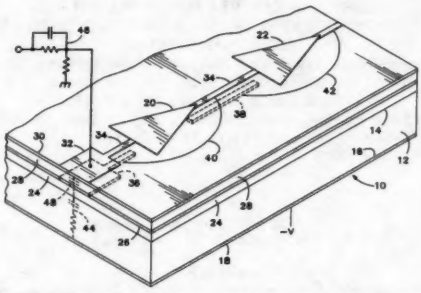
5,151,775

INTEGRATED CIRCUIT DEVICE HAVING IMPROVED SUBSTRATE CAPACITANCE ISOLATION

Matthew J. Hadwin, Beaverton, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed Oct. 7, 1991, Ser. No. 772,753
Int. Cl.[5] H01L *39/02, 23/48, 27/02*
U.S. Cl. 357—80 **7 Claims**

1. An integrated circuit having improved substrate capacitance isolation wherein the integrated circuit has a substrate with a metal layer formed on one surface thereof and a high impedance circuit with an input node formed on an opposite surface with the input node coupling an electrical signal to the high impedance circuit, the improvement comprising an electrically conductive layer having a geometry substantially equal to the input node and being disposed between the input node and the metal layer on the substrate with the electrically conductive layer being immediately underneath and insulated



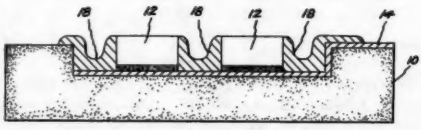
from the input node by an insulating layer with the electrically conductive layer being driven by the output of the high impedance circuit.

5,151,776

DIE ATTACHMENT METHOD FOR USE IN HIGH DENSITY INTERCONNECTED ASSEMBLIES

Robert J. Wojnarowski, Ballston Lake, and Charles W. Eichelberger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 329,478, Mar. 28, 1989, Pat. No. 5,019,535.
This application Mar. 19, 1991, Ser. No. 671,612
Int. Cl.[5] H01L *23/02*
U.S. Cl. 357—81 **18 Claims**



1. An interconnect system for an integrated circuit chip mounted on a substrate, said chip having an active surface, a mounting surface opposite said active surface, and side surfaces extending between said active and mounting surfaces, said system comprising:
a conductive layer on said substrate adapted to be maintained at a predetermined voltage level;
a nonconductive adhesive material affixing said mounting surface of said integrated circuit chip to said conductive layer, said nonconductive adhesive material not entirely covering said conductive layer; and
a layer of metallization electrically connecting said side surfaces of said integrated circuit chip to said conductive layer, said layer of metallization being sufficiently thick to provide thermal cooling for said integrated circuit chip over substantially the entire thickness of said chip.

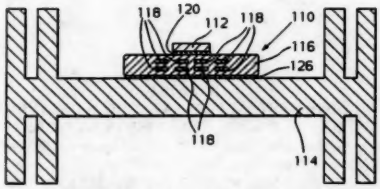
5,151,777
INTERFACE DEVICE FOR THERMALLY COUPLING AN INTEGRATED CIRCUIT TO A HEAT SINK

Timur Akin, Toledo, Ohio; Bruce A. Myers, Kokomo, Ind.; William M. Maki, Fort Wayne, Ind., and Ponnusamy Palanisamy, Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Continuation-in-part of Ser. No. 318,389, Mar. 3, 1989, abandoned. This application Oct. 16, 1989, Ser. No. 422,395

Int. Cl.[5] H01L *39/02, 23/02, 25/04*

U.S. Cl. 357—81 **6 Claims**



1. An interface device for thermally coupling an integrated circuit chip to a heat sink, the interface device comprising:

a layer of copper;

a plurality of regions comprising an iron-nickel alloy characterized by a low coefficient of thermal expansion, each of said plurality of regions are completely enveloped by said copper, and are disposed laterally with respect to each other and generally under the integrated circuit chip between the integrated circuit chip and heat sink, such that said copper is provided continuously between the integrated circuit and the heat sink; and

said interface device having an effective coefficient of thermal expansion intermediate between that of said copper and said iron-nickel alloy and characterized by a thermal conductivity similar to the thermal conductivity of said copper.

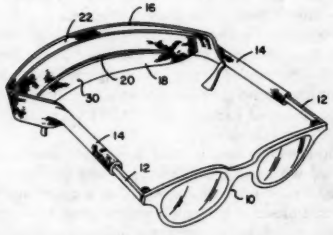
5,151,778
EYEGLASS CASE AND RETAINER

Paul Conley, N30 W29101 Hillcrest Dr., Pewaukee, Wis. 53072

Filed Sep. 23, 1991, Ser. No. 763,953

Int. Cl.[5] G02C *3/00;* **A45C** *11/04*

U.S. Cl. 351—156 **17 Claims**



1. A case for holding eyeglasses of the type having a frame including a bridge adapted to be placed on the nose of a wearer and a pair of bows hingedly connected to the frame and adapted to be moved between a folded position against the frame and an open position wherein the bows can be placed on the ears of the wearer, the eyeglass case comprising:

a. an elongate base made of a flexible material and having a top side and an under side and an outer perimeter defined by spaced apart upper and lower edges and opposite end edges;

b. a pair of elongate straps extending outwardly from the opposite end edges of the base, one each of said straps adapted to be releasably secured to one of the bows;

c. a flexible sheet having a perimeter conforming substantially to the outer perimeter of the base and secured to the underside of the base about the sheet perimeter; and

d. an elongate, through slot in said sheet adapted for receiving the eyeglasses when said bows are in the folded position for enveloping the eyeglasses between the base and said sheet.

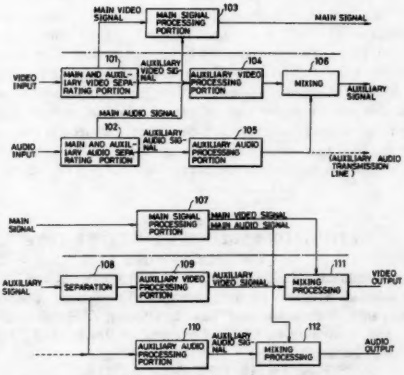
5,151,779
SIGNAL TRANSMISSION SYSTEM FOR HIGH DEFINITION TELEVISION

Yasuaki Kanatsugu; Taiichiro Kurita; Taiji Nishizawa; Yutaka Tanaka; Ryoichi Yajima; Shoichi Suzuki; Hisakazu Kato; Kazumasa Enami; Haruo Okuda; Satoru Koizumi; Hideki Suganami; Toshiyuki Takegahara, and Kaoru Watanabe, all of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed May 30, 1990, Ser. No. 530,760

Int. Cl.[5] H04N *7/08, 11/06*

U.S. Cl. 358—12 **20 Claims**



1. An encoder for encoding a television signal into a main signal to be transmitted by a main transmission line and an auxiliary signal to be transmitted by an auxiliary transmission line, said encoder comprising:

separation means for separating a second television signal having higher definition than a first television signal into a main television signal and an auxiliary television signal, said separation means including a dividing means for dividing said second television signal into a first band corresponding to that of said first television signal and a second band above said first band, said main television signal having a bandwidth corresponding to that of the first television signal, said auxiliary television signal having information, the amount of which corresponds to that of said second band;

main signal processing means for producing said main signal from said main television signal, said main signal having a bandwidth equal to that of said main transmission line; and

auxiliary signal processing means for producing said auxiliary signal from said auxiliary television signal, said auxiliary signal having a bandwidth equal to that of said auxiliary transmission line.

5,151,780

DIFFERENTIAL AMPLIFIERS

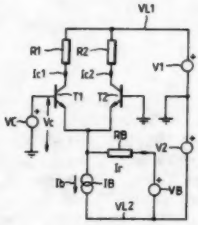
David M. Chapman, Southampton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 9, 1999, Ser. No. 491,136

Claims priority, application United Kingdom, Mar. 10, 1989, 8905525

Int. Cl.[5] H04N *9/64*

U.S. Cl. 358—21 R **3 Claims**



1. A differential amplifier comprising two transistors having their collectors connected through respective loads to one supply line, their emitters connected together and to a controllable constant current source which supplies a bias current and which is connected between the common connection of the emitters and return supply line, and their bases connected to receive a control voltage, which differential amplifier is characterized in that the common connection of the emitters is also connected through a by-pass resistance to a bias voltage source, the circuit parameters being such that flow of bias current will result in a small current being diverted through the by-pass resistance instead of flowing through said transistors, this small current approximating ir value to the value of any residual bias current when the current source is switched off, and having a value which is negligible relative to the value of the bias current when the current source is switched on.

5,151,781

METHOD OF RECORDING COLOR IMAGE INFORMATION

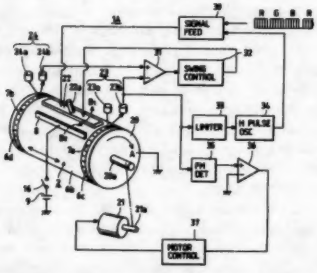
Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Miura; Tsutou Asakura; Masato Furuya, both of Yokohama; Yoshihisa Koyama, Yokosuka, and Yuji Uchiyama, Chigasaki, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 10, 1991, Ser. No. 727,633

Claims priority, application Japan, Jul. 13, 1990, 2-186074; Jul. 24, 1990, 2-196738; Jul. 24, 1990, 2-196741

Int. Cl.[5] H04N *3/15, 5/30, 9/07;* **G02F** *1/135*

U.S. Cl. 358—45 **3 Claims**



1. A method of recording color image information on a recording medium including a color stripe filter having different-color filter stripes, comprising the steps of:

providing marks on the recording medium in correspondence with the filter stripes of the color stripe filter;

detecting the marks on the recording medium;

recording color line sequential signals on the recording medium; and

synchronizing said recording of the color line sequential signals with said detecting of the marks on the recording medium.

5,151,782

CONTROL SYSTEM FOR SATELLITE DELIVERED PAY-PER-VIEW TELEVISION SYSTEM

Andrew G. Ferraro, Monroe, N.Y., assignor to Reiss Media Enterprises, New York, N.Y.

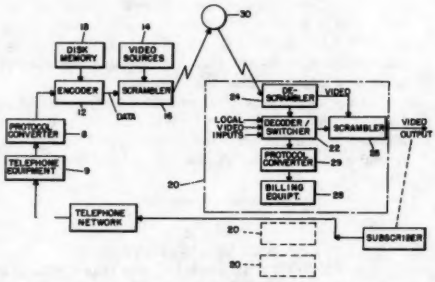
Filed May 17, 1989, Ser. No. 352,857

Int. Cl.[5] H04H *1/02;* **H04M** *11/08;* **H04N** *7/10*

U.S. Cl. 358—86 **20 Claims**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 15 Pages)



7. A system for providing automated ordering of television programs by a subscriber of a local cable television system by direct toll-free telephone dialing an originating source which provides television programs according to a predetermined schedule to a network of cable television systems including said subscriber's local cable television system for delivery, in turn, to respective subscribers according to a predetermined local schedule with each program identified by the time of day at which it is scheduled to start, said originating source including means for receiving toll-free telephone calls and providing Automatic Number Identification (ANI) information for callers, said system comprising:

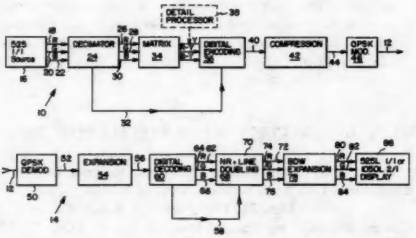
data processing means at said originating source interconnected with said means for receiving telephone calls to receive ANI information regarding a caller and wherein the data processing means is programmed to compare area code and telephone exchange information contained in said ANI information with stored area code and telephone exchange information identifying the site of each said one or more local cable television systems for determining which of said local cable television systems serves the caller and, provided the telephone call is received within a prescribed time period relative to the scheduled start of an offered program, to automatically assemble and communicate to the local cable television system determined to serve the caller a message signal containing information signifying that an identified one of its subscribers has ordered a particular program.

5,151,783

DIGITAL TELEVISION WITH ENHANCEMENT

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos Hills, Calif. 94022

Filed Jun. 5, 1991, Ser. No. 710,823
Int. Cl.[5] H04N 7/13
U.S. Cl. 358—133 30 Claims



1. A television system comprising:

encoder means including digital picture source means for converting an electrical television picture image signal into a stream of digital values representing picture element signals at a recurrent picture frame rate, the digital values representing samples of the picture information at a predetermined sampling rate, compression means for compressing the stream of digital values, and digital modulation means translating the compressed stream of digital values into carrier modulation contained within a defined spectral modulation bandwidth, the encoder means for communicating the carrier modulation through a limited bandwidth medium means,

decoder means connected to the limited bandwidth medium means for receiving and detecting the carrier modulation and comprising:

digital demodulation means for demodulating the received modulation into a stream of received compressed digital values,

digital expansion means operating in a compatible manner with the compression means for expanding the received compressed digital values into received expanded values, and

single-ended picture resolution enhancement processing means for processing the received expanded digital values into resolution enhanced digital picture values for display upon an enhanced resolution display means connected to receive the enhanced digital picture values.

5,151,784

MULTIPLE FRAME MOTION ESTIMATION

Fabio Lavagetto, Genoa, Italy, and Riccardo Leonardi, Geneva, Switzerland, assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 30, 1991, Ser. No. 693,878
Int. Cl.[5] H04N 7/12
U.S. Cl. 358—136 29 Claims

1. A method for developing an encoded signal of a block of pels to be encoded located at a predetermined location in a frame of an applied video signal comprised of frames, wherein each frame contains at least one image representation, by developing a set of signals representing displacements and corresponding weights from at least two frames of said video signal that are designated as reference frames and are divided into blocks of pels, comprising the steps of:

a. storing said reference frames in a memory;

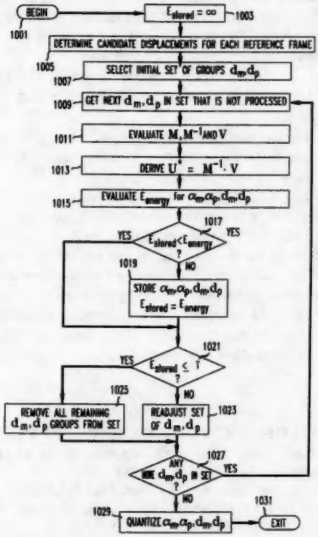
b. selecting, in accordance with a predetermined selection criterion, for each of said reference frames, one or more candidate displacements, measured from said location of said block to be encoded, whose vector magnitude is less than or equal to the vector magnitude of a predetermined maximum displacement;

c. culling, from said candidate displacements that have been determined, a set of groups of candidate displacements such that each group of said set has one candidate displacement member from each of said reference frames;

d. ordering said groups of said set of groups in accordance with a predetermined ordering criterion;

e. assigning to each group a set of best candidate weights for said group, one candidate weight corresponding to each member of said group;

f. generating for each of said groups a composite error signal indicating differences between values of pels of said block being encoded and a weighted sum of values of pels of said blocks of said reference frames that are displaced, from said location of said block being encoded, by corresponding ones of said candidate displacements in said groups of said candidate displacements, said weighted sum being determined by multiplying corresponding ones of said values of pels of said blocks of said stored reference frames



by corresponding ones of said set of best candidate weights for said group;

g. storing said best candidate weights, said corresponding group and said composite error signal for a group of said set of groups having a minimum composite error signal, if said composite error signal is less than any previously stored composite error signals or no composite error signal has been previously stored;

h. repeating steps (b) through (h) until a predetermined condition is met by a group of said candidate displacements and said corresponding set of best candidate weights for said group;

i. forming said encoded signal corresponding to said block, from which a version of said block can be reconstructed if a copy of said stored reference frames is available, by including in said encoded signal said group of candidate displacements and said set of best candidate weights for said group for which said predetermined condition is met; and

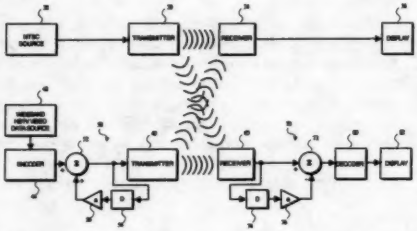
j. delivering said encoded signal to a transmission medium.

5,151,785

HDTV TRANSMISSION SYSTEM WITH REDUCED SUSCEPTIBILITY TO NTSC COCHANNEL INTERFERENCE

Richard W. Citta, Oak Park, Ill., assignor to Zenith Electronics Corporation

Filed Jun. 4, 1991, Ser. No. 709,960
Int. Cl.[5] H04N *7/04*
U.S. Cl. 358—141 **13 Claims**



1. A method of transmitting an HDTV signal from a site within a first television service area using a channel also used to transmit an NTSC television signal from a site within a nearby television service area, comprising:

providing a digital signal representing said HDTV signal, said digital signal having a substantially flat frequency spectrum;

imposing a predetermined spectral periodicity on said digital signal corresponding to the spectral periodicity characterizing said NTSC television signal;

transmitting said digital signal over said channel such that the spectral periodicities of said digital and NTSC signals are substantially phase coincident; and

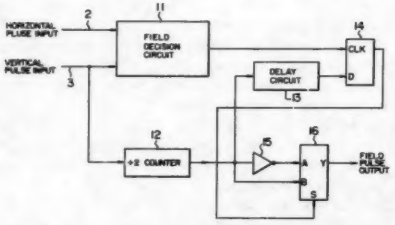
receiving said transmitted signal and subjecting the received signal to a filter response having a characteristic comprising the inverse of said predetermined spectral periodicity, whereby said received digital signal is substantially restored while any received components of said NTSC signal are substantially attenuated.

5,151,786

FIELD DECISION CORRECTION APPARATUS

Sigeharu Kawamoto, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 6, 1991, Ser. No. 711,132
Claims priority, application Japan, Jun. 21, 1990, 2-163326
Int. Cl.[5] H04N *5/04*
U.S. Cl. 358—148 **3 Claims**



1. A field decision correction apparatus comprising:

a field decision circuit for providing as an output a field decision on the basis of a horizontal pulse and a vertical pulse, said horizontal pulse and said vertical pulse being video synchronizing pulses of a video signal;

a frequency division circuit for dividing the frequency of said vertical pulse in half, and providing said divided frequency as in output;

a flip-flop supplied with a decision from said field decision circuit on one of at least two input terminals thereof and supplied with the output of said frequency division circuit via a delay circuit on another of the at least two input terminals thereof; and

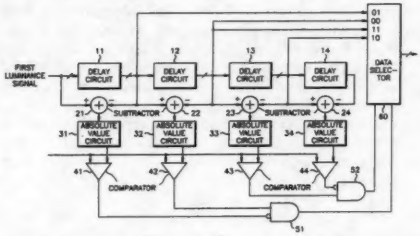
a selection circuit supplied with the output of said frequency division circuit via an inverter circuit on one of at least two input terminals thereof and supplied directly with the output of said frequency division circuit on another of the at least two input terminals thereof to select and output either of those input signals on the basis of the output of said flip-flop.

5,151,787

METHOD AND CIRCUIT FOR CORRECTING IMAGE EDGE

Young-Jun Park, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Dec. 21, 1990, Ser. No. 632,074
Claims priority, application Rep. of Korea, Dec. 23, 1989, 1989-19443
Int. Cl.[5] H04N *5/208*
U.S. Cl. 358—162 **12 Claims**



1. An edge correcting circuit which generates a edge correction signal by reducing the conversion time of a signal level at a edge region of a luminance signal said circuit comprising:

a first control signal generator which generates a first control signal by detecting a pixel where said luminance signal starts to change;

a second control signal generator which generates a second control signal by detecting a pixel prior to a stabilization of said luminance signal from a change;

wherein said second control signal generator comprises:

a first delay circuit and a second delay circuit which are in serial connection and generate a second luminance signal and a third luminance signal each delayed a predetermined time;

a first subtractor and a second subtractor which generate a first difference signal and a second difference signal by subtracting said second luminance signal and said third luminance signal from said luminance signal and said second luminance signal, respectively;

a first absolute value circuit and a second absolute value circuit which generate a first absolute value signal and a second absolute value signal in response to said first difference signal and said second difference signal, respectively;

a first comparator and a second comparator which generate a first comparator signal and a second comparator signal by comparing said first absolute value signal and said second absolute value signal to a reference signal, respectively, to reduce noise; and

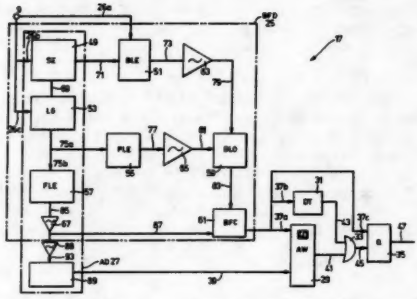
a first gate which generates said second control signal when a level of said third luminance signal changes to a stable state signal level from an unstable state signal level by logically multiplying an inverse of said first comparator signal by said second comparator signal.

5,151,788

METHOD AND APPARATUS FOR IDENTIFYING AND ELIMINATING SPECIFIC MATERIAL FROM VIDEO SIGNALS

Dieter W. Blum, 104-969 Jervis Street, Vancouver, B.C. V6E 2B7, Canada

Filed Jan. 26, 1989, Ser. No. 301,769
Claims priority, application Canada, Jan. 26, 1988, 557321
Int. Cl.[5] H04N 5/44
U.S. Cl. 358—188 74 Claims



1. A method for detecting a blank frame in a video signal, the method comprising:

extracting the black level from the video signal to produce a black level signal;

gating undesired portions from the video signal to produce a gated signal;

continuously extracting the luminance level from the gated signal to produce an average luminance level signal representative of the average luminance level of a frame; and

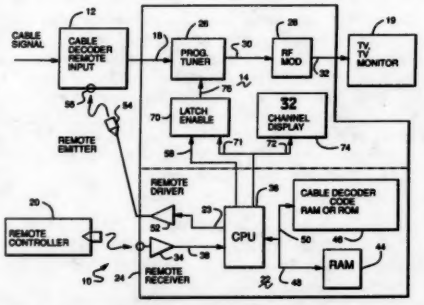
comparing the black level signal and the average luminance signal to determine when the average luminance level signal is within a given threshold of the black level signal.

5,151,789

SYSTEM AND METHOD FOR AUTOMATIC, UNATTENDED RECORDING OF CABLE TELEVISION PROGRAMS

Patrick Young, San Mateo, Calif., assignor to Insight Telecast, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 428,620, Oct. 30, 1989, abandoned. This application Oct. 17, 1991, Ser. No. 778,404
Int. Cl.[5] H04N 7/18, 5/44
U.S. Cl. 358—194.1 32 Claims



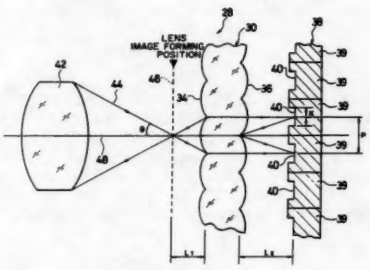
1. A video recording system to allow automatic, unattended recording of cable television programs supplied sequentially at different times on different channels of a cable system, comprising a television receiver, a remote controllable cable decoder and a remote controllable video recorder with unattended programming capability connected between said television receiver and said remote controllable cable decoder, a remote controller for said remote controllable video recorder coupled to said remote controllable video recorder, said remote controller including means for transmitting program selections from a television schedule to said remote controllable video recorder, said remote controllable video recorder including a channel selection coordinator, said channel selection coordinator including a memory means for storing channel tuning conversion information and program selections transmitted to said remote controllable video recorder by said remote controller, a means for converting channels of the program selections to channel tuning commands recognizable by said remote controllable cable decoder using the channel tuning conversion information and the program selections, a means for automatically transmitting the channel tuning commands to said remote controllable cable decoder at broadcast times of the program selections, and a means for automatically supplying recording commands to said remote controllable video recorder at the broadcast times of the program selections.

5,151,790

IMAGE PICKUP DEVICE FOR STABILIZING OPTICAL ABERRATIONS

Naoki Takatori, and Masaaki Orimoto, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 5, 1991, Ser. No. 726,054
Claims priority, application Japan, Jul. 23, 1990, 2-194131
Int. Cl.[5] H04N 5/225; G02B 13/16
U.S. Cl. 358—225 6 Claims



1. An image pickup device comprising:

an image pickup element including a plurality of photoelectric conversion elements each having a light receiving portion, wherein said light receiving portions of said photo-electric conversion elements are positioned at a constant pitch relative to said light receiving portions of adjacent photo-electric conversion elements;

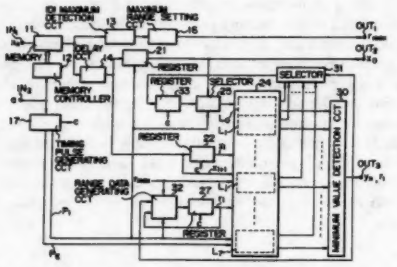
a taking lens positioned in front of an image forming position for allowing an image of an object to be formed at said image forming position, said position being located in front of said image pickup element; and,

an optical filter interposed between said image forming position and said image pickup element for receiving a spot image formed by light diverging from said image forming position, to guide said diverging light to said plurality of photo-electric conversion elements.

5,151,791
EFFICIENT ENCODING OF PICTURE SIGNAL

Yoshiaki Moriyama, and Satomi Kobayashi, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 24, 1990, Ser. No. 587,006
Claims priority, application Japan, Sep. 26, 1989, 1-251138
Int. Cl.[5] H04N *1/41*
U.S. Cl. 358—261.2 **12 Claims**



1. A picture signal encoding method of a predictive encoding type that sequentially encodes picture elements such that a current picture element being encoded is preceded by a previous, already encoded, picture element and is followed by one or more next picture elements that are yet to be encoded, said method comprising the steps of:

for a current picture element to be encoded,

generating a plurality of error data values from a plurality of decoded values of the current picture element;

generating a plurality of predicted error data values from a value of a next picture element and from the plurality of decoded values of the current picture element;

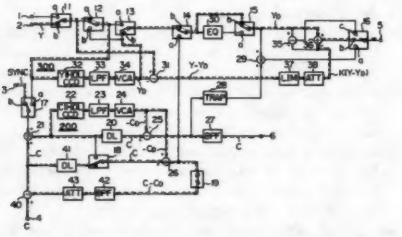
summing individual ones of the plurality of error data values with a corresponding individual one of the plurality of predicted error data values to obtain a plurality of error estimation values; and

generating a code word for encoding the current picture element by selecting a minimum one of the plurality of error estimation values.

5,151,792
VIDEO SIGNAL REPRODUCING APPARATUS WITH MEANS FOR PRODUCING A CROSSTALK ELIMINATED LUMINANCE OUTPUT SIGNAL

Takao Yoshikawa, Chiba, and Isao Masuda, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 22, 1991, Ser. No. 659,268
Claims priority, application Japan, Feb. 27, 1990, 2-047012
Int. Cl.[5] H04N *9/71*
U.S. Cl. 358—327 **14 Claims**

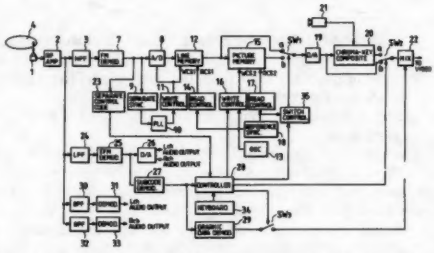


1. In apparatus for reproducing video signals from adjacent tracks on a record medium, the combination comprising: chrominance signal reproducing means for reproducing a chrominance signal with reduced crosstalk; luminance signal reproducing means for reproducing a luminance signal; delay means for delaying the reproduced luminance signal by a horizontal line interval; difference means for producing a difference signal representing a difference between the delayed and undelayed luminance signals; first combining means for combining the difference signal and the delayed luminance signal to produce a crosstalk-eliminated delayed luminance signal; second combining means for combining the difference signal and the reproduced luminance signal to produce a crosstalk-eliminated undelayed luminance signal; and selector means for selecting the crosstalk-eliminated delayed luminance signal or the crosstalk-eliminated undelayed luminance signal as a luminance output signal.

5,151,793
RECORDING MEDIUM PLAYING APPARATUS

Hiroshi Ito, Saitama; Seigo Ando, Tokyo, and Bonpei Inaba, Saitama, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 30, 1990, Ser. No. 574,873
Claims priority, application Japan, Feb. 26, 1990, 2-45048
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—335 **5 Claims**



1. A recording medium playing apparatus for playing at least a multiplexing signal from a recording medium on which said multiplexing signal is recorded, said multiplexing signal including a modulation carrier signal for carrying a composite video signal and a digital modulation signal for carrying a digital graphics signal, said apparatus comprising:

first extracting means for extracting said modulation carrier signal from said multiplexing signal;

second extracting means for extracting said digital modulation signal from said multiplexing signal;

first demodulating means for demodulating said composite video signal from said modulation carrier signal extracted by said first extracting means;

second demodulating means for demodulating said digital graphics signal included on said digital modulation signal extracted by said second extracting means;

chroma-key composing means for combining a video signal input from a video camera with said composite video signal from said first demodulating means to output a chroma-key composite signal; and

graphics composing means for superimposing said digital graphics signal from said second demodulating means on said chroma-key composite signal.

5,151,794
IMAGE PROCESSING METHOD

Ryohei Kumagai, Tokyo, Japan, assignor to Ezel Inc., Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,350
Int. Cl.[5] H04H *1/40*
U.S. Cl. 358—447 **10 Claims**

1. An image processing method for smoothing without dulling edges, comprising the steps of:

representing an image as image pixels;
grouping image pixels of a predetermined convolution into a plurality of groups, each including a plurality of pixels;
calculating a median for each said group of image pixels;

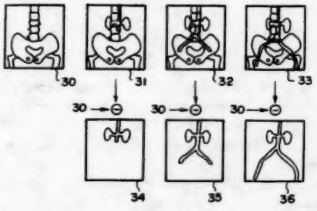
calculating a median of all said group medians; and
altering a pixel of a group in accordance with the median of said medians so as to generate a smoothed image.

5,151,795

METHOD FOR COMPRESSING AND EXTENDING IMAGE SIGNALS

Yuuma Adachi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 9, 1990, Ser. No. 564,823
Claims priority, application Japan, Aug. 11, 1989, 1-208754
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—448 **12 Claims**



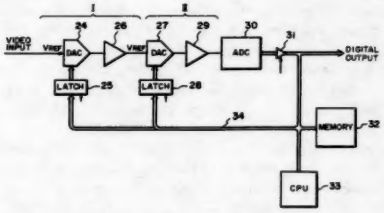
1. A method for compressing and extending image signals, comprising the steps of:
i) obtaining a recording of a set of images, which represents a plurality of images, wherein the images of a single object are recorded simultaneously or sequentially,
ii) carrying out inter-image operation processing on the image signals representing the plurality of said images,
iii) carrying out signal compression processing on image signals, which have been obtained from said inter-image operation processing,
iv) in the course of reproducing said images, carrying out signal extension processing on image signals, which have been obtained from said signal compression processing, and
v) carrying out reversed inter-image operation processing, which corresponds to the reversed operation of said inter-image operation processing, on image signals, which have been obtained from said signal extension processing, whereby image signals corresponding to said images are obtained.

5,151,796

IMAGE READING APPARATUS HAVING A D/A CONVERTER WITH A CONTROLLABLE OUTPUT

Yasuo Ito, Inagi, and Hiroshi Kyogoku, Nishimine, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1990, Ser. No. 500,394
Claims priority, application Japan, Mar. 29, 1989, 1-74901; Jun. 1, 1989, 1-137423; Jun. 1, 1989, 1-137424
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—461 **18 Claims**



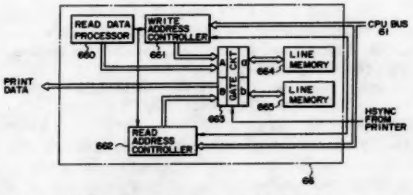
1. An image reading apparatus comprising:
a light source for illuminating an original image;
reading means for photoelectrically reading the original image illuminated by said light source and generating an analog image signal;
a D/A converter having a digital input terminal, an analog output terminal, and a reference terminal, the analog image signal generated from said reading means being applied to the reference terminal, said D/A converter attenuating a level of the analog image signal applied to the reference terminal based on a damping factor corresponding to digital data applied to the digital input terminal, the attenuated analog image signal being output from the analog output terminal;
amplifying means for amplifying the attenuated analog image signal outputted from the analog output terminal of said D/A converter;
an A/D converter for converting the amplified analog image signal outputted from said amplifying means into a digital image signal; and
control means for controlling the digital data applied to the digital input terminal of said D/A converter to cause the analog image signal supplied to said A/D converter to have a predetermined level.

5,151,797

IMAGE FORMING APPARATUS WITH IMPROVED IMAGE FORMING SPEED

Takefumi Nosaki, Yokohama, and Kazuo Sasama, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 16, 1990, Ser. No. 465,362
Claims priority, application Japan, Jan. 27, 1989, 1-16211
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—474 **17 Claims**



1. An image forming apparatus provided with a scanner part and a printer part, comprising:

means for reciprocally scanning an original to convert an image of the original to image data;

means for driving said scanning means so that the image data converted by said scanning means includes first image data when said original is scanned in a first scanning direction and second image data when the original is scanned in a second scanning direction opposite to the first scanning direction;

means for storing said first and second image data;

means for alternately writing said first and second image data into said storing means;

means for reading the first image data from said storing means in accordance with a first reading order, and reading the second image data from said storing means in accordance with a second reading order, so that data containing said first and second image data is output from said storing means when said second reading order is opposite to said first reading order; and

means for sending to a first predetermined place a first print output corresponding to the first image data read by said reading means, and sending to a second predetermined place a second print output corresponding to the second image data read by said reading means.

5,151,798

HOLOGRAM SCALE

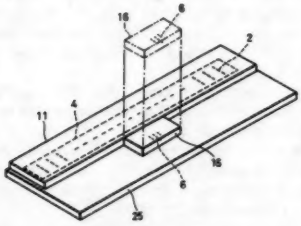
Hiroyuki Okubo, Kanagawa, Japan, assignor to Sony Magnescale Inc., Tokyo, Japan

Filed Aug. 16, 1991, Ser. No. 745,706

Claims priority, application Japan, Aug. 30, 1990, 2-229153

Int. Cl.[5] G02B *5/32*; G03H *1/02*

U.S. Cl. 359—1 **6 Claims**



1. A hologram scale comprising:

(a) a hologram grating plate in which a hologram grating is formed; and

(b) a protecting substrate on which an origin and/or fixed point detecting scale of said hologram grating is formed, wherein said protecting substrate is bonded to said hologram grating plate so as to cover said hologram grating plate at its surface on which said hologram grating is formed.

5,151,799

SYSTEM AND TECHNIQUE FOR MAKING HOLOGRAPHIC PROJECTION SCREENS

David A. Ansley, Long Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 11, 1991, Ser. No. 653,526

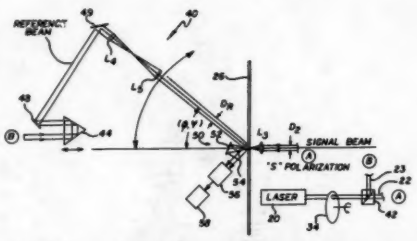
Int. Cl.[5] G03H *1/14, 1/30*

U.S. Cl. 359—11 **15 Claims**

15. A method for stabilizing an image in a system for making holographic projection screens including the steps of:

a) monitoring an interference pattern created by a signal beam and a reference beam;

b) providing control signals in response to said interference pattern created by the signal beam and the reference beam; and



c) inducing a phase shift in said reference beam in response to said control signals using a movable roof prism.

5,151,800

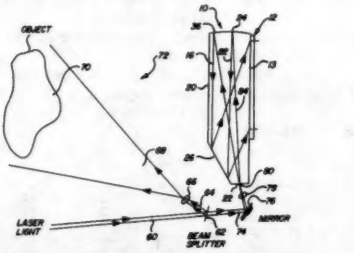
COMPACT HOLOGRAM DISPLAYS & METHOD OF MAKING COMPACT HOLOGRAM

Juris Upatnieks, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Dec. 17, 1990, Ser. No. 627,984

Int. Cl.[5] G03H *1/22*

U.S. Cl. 359—14 **24 Claims**



1. A hologram display apparatus characterized by:

a transparent plate with a pair of opposing surfaces and edge surfaces therebetween;

one of said opposing surfaces having a hologram thereagainst;

an illuminating light source for producing a light beam for illuminating said hologram: and

said illuminating light source being optically mounted on one of said edge surfaces of said transparent plate such that expansion of said light beam from said source occurs within said transparent plate, and said illuminating light source further directing said light beam to reflect against at least one surface of said transparent plate before illuminating said hologram at said one of said opposing surface.

5,151,801

LIQUID CRYSTAL DISPLAY APPARATUS PROVIDING IMPROVED ILLUMINATION VIA TRUCATED PRISMS

Yasunori Hiroshima, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 29, 1990, Ser. No. 619,641

Claims priority, application Japan, Nov. 30, 1989, 1-308881

Int. Cl.[5] G02F *1/1335*

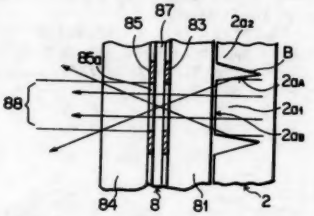
U.S. Cl. 359—40 **3 Claims**

1. A liquid crystal display apparatus comprising:

an active matrix type liquid crystal cell;

a light source to radiate illuminating light onto the back of the liquid crystal cell; and

optical means on the light source side of the liquid crystal cell and disposed close to and facing pixels of the liquid crystal cell, said optical means being adapted to focus the rays of light from the light source on each of the pixels,



wherein said optical means includes a transparent optical sheet having on a surface thereof a number of truncated prisms equal to the number of pixels, and wherein each of said prisms is aligned with a respective one of said pixels of the liquid crystal cell.

5,151,802

DEVICE FOR FORMING IMAGES ON A LARGE SURFACE AND SIMULATOR EQUIPPED WITH SUCH A DEVICE

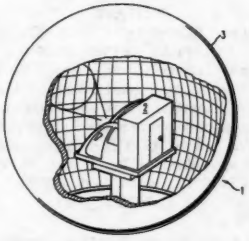
Alain Couturier, Les Essarts Le Roi, France, assignor to Thomson-CSF, Puteaux, France

Filed May 30, 1991, Ser. No. 707,564

Claims priority, application France, Jun. 19, 1990, 90 07640

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—51 **10 Claims**



1. A simulator for simulating operation of a vehicle for an operator, comprising:

a control booth for duplicating controls of the vehicle; and

a display screen viewable from inside said booth for simulating a view from the vehicle, the display screen including an active screen at least a portion of which is spherical and having a display device which is formed at least partly by juxtaposed cells each constituting an image-forming surface of a device for producing images, the cells being excited individually, cells not excited being dark, wherein the cells comprise sheets of encapsulated liquid crystals.

5,151,803

PIXEL-GAP CONTROLLED FERROELECTRIC LIQUID CRYSTAL DISPLAY DEVICE AND ITS DRIVING METHOD

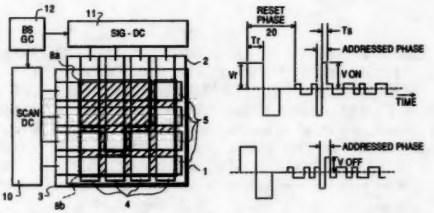
Naohide Wakita, Osaka; Yoshio Iwai, Takatsuki; Tsuyoshi Uemura, Kadoma; Hiroyuki Ohnishi, Ikeda; Kazuhiro Johten, Hirakata; Satoshi Kimura, Osaka, and Shozo Fujiwara, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 3, 1990, Ser. No. 460,555

Claims priority, application Japan, Jan. 9, 1989, 1-2422; May 26, 1989, 1-133442

Int. Cl.[5] G02F *1/133;* G09G *3/36*

U.S. Cl. 359—56 **12 Claims**



1. A liquid crystal display device comprising a liquid crystal panel in which a ferroelectric liquid crystal is sandwiched between upper and lower substrates each having a plurality of electrodes to form a plurality of pixels at intersection of said electrodes of said upper and lower substrates and means for applying a predetermined voltage to adjacent pixels in said plurality of pixels having a magnitude and pulse width which are sufficient to switch a stable condition of a gap at a non-intersection of said electroder of said upper and lower electrodes and between the adjacent pixels, wherein said predetermined voltage switches the stable condition of the gap to a dark condition when both of the adjacent pixels are set in a dark condition by said predetermined voltage, and to a bright condition or an intermediate condition when both of the adjacent pixels are set in a bright condition by said predetermined voltage.

5,151,804

FERROELECTRIC LIQUID CRYSTAL DISPLAY HAVING A SPREAD OF ANGLES FOR GRAYSCALE AND METHOD OF MANUFACTURE

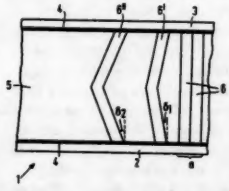
Antonius G. H. Verhulst; Wilbert J. A. M. Hartmann; Franciscus J. Stommels, and Ann M. M. Luyckx-Smolders, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 11, 1990, Ser. No. 535,809

Claims priority, application Netherlands, Jun. 12, 1989, 8901481

Int. Cl.[5] G02F *1/1343, 1/1339, 1/13*

U.S. Cl. 359—56 **33 Claims**



1. A liquid crystal device comprising a ferroelectric liquid crystal medium having smectic layers between two supporting plates provided with electrodes, said device has a transmission-

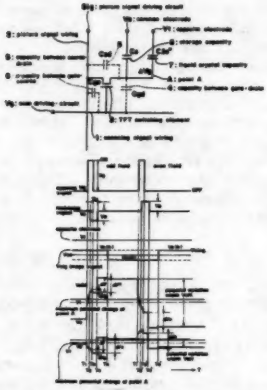
voltage characteristic, characterized in that the smectic layers exhibit a spread of angles with respect to at least one of the supporting plates, whereby a gradual transmission/voltage characteristic is achieved.

5,151,805

CAPACITIVELY COUPLED DRIVING METHOD FOR TFT-LCD TO COMPENSATE FOR SWITCHING DISTORTION AND TO REDUCE DRIVING POWER

Etsuya Takeda, Suita; Yutaka Nanno, Amagasaki, and Seiichi Nagata, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 26, 1990, Ser. No. 617,883
Claims priority, application Japan, Nov. 28, 1989, 1-308676
Int. Cl.[5] G02F *1/133;* G09G *3/36*
U.S. Cl. 359—57 **4 Claims**



1. In a method for driving a display apparatus comprising matrix-arranged picture element electrodes each connected to a first wiring through a storage capacity, each picture electrode being connected to a thin film transistor which is electrically connected to a picture signal wiring and a scanning signal wiring, and liquid crystal material hold between each picture electrode and an opposite electrode and being driven by an alternative current voltage, the improvement thereof comprising the steps of:

transferring a picture signal voltage to the picture element electrode during an "on" period of the thin film transistor;

feeding a modulation signal which is equal in absolute value and is different in polarity for every field to the first wiring during an "off" period of the thin film transistor to change the voltage of the picture element electrode;

loading a voltage across the display material by adding to, or substracted from, the changed voltage of the picture element electrode and the voltage of the picture signal; and

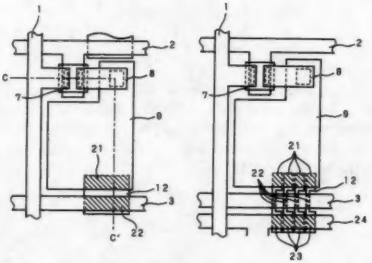
keeping at a constant voltage the difference between an average central voltage of picture signal voltage Vst and a voltage Vt of the opposite electrode.

5,151,806

LIQUID CRYSTAL DISPLAY APPARATUS HAVING A SERIES COMBINATION OF THE STORAGE CAPACITORS

Satoru Kawamoto; Noaki Nakagawa, and Masahiro Hayama, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1991, Ser. No. 665,591
Claims priority, application Japan, Apr. 27, 1990, 2-114301
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—59 **3 Claims**



1. A liquid crystal display apparatus comprising:

a TFT (thin film transistor) array in which a plurality of common electrode lines, a plurality of gate electrode lines and a plurality of source electrode lines intersecting said common electrode lines and gate electrode lines are provided on a transparent insulating substrate, with a TFT in the vicinity of each intersection of said gate electrode line and source electrode line, having a pixel electrode corresponding to a pixel connected to a drain electrode of said TFT, said pixel electrode being arranged so as not to overlap with said common electrode line;

counter electrodes provided confronting said TFT array;

a liquid crystal for display sandwiched between said counter electrodes and TFT array; and

a floating electrode arranged to overlap said pixel electrode to form a first storage capacitor and to overlap said common electrode line to form a second storage capacitor so that said pixel electrode and said common electrode line are connected by a series combination of said first storage capacitor and said second storage capacitor.

5,151,807

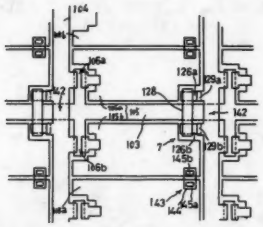
ACTIVE MATRIX SUBSTRATE AND ACTIVE MATRIX DISPLAY APPARATUS

Mikio Katayama, Ikoma; Hiroaki Kato, Nara; Takayoshi Nagayasu, Nara; Akihiko Imaya, Nara; Hidenori Negoto, Ikoma; Yuzuru Kanemori, Tenri, and Toshihiko Hirobe, Sakai, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Jan. 30, 1990, Ser. No. 472,604
Claims priority, application Japan, Jan. 31, 1989, 1-23486; Jun. 21, 1989, 1-159901; Aug. 14, 1989, 1-209769
Int. Cl.[5] G02F *1/133*
U.S. Cl. 359—59 **6 Claims**

1. An active matrix display apparatus comprising a pair of substrates at least one of which is translucent, a display medium charged between said substrates, the optical characteristics of said display medium being modulated in response to an applied voltage, picture element electrodes disposed in a matrix on one of said pair of substrates, each of said picture element electrodes being composed of a pair of divided electrodes, a first bus wiring disposed between said pair of divided electrodes, and a second bus wiring intersecting with said first bus wiring, wherein a connection region comprises a pair of electrical conductor layers disposed at both sides of said first bus wiring and extending in parallel thereto, a pair of electrical conductor pieces superposed on portions of said electrical

conductor layers so as to sandwich an insulating film therebetween in a non-conductive state, respectively, portions of said divided electrode superposed on said electrical conductor pieces in a conductive state respectively, and a spare wiring intersecting with said first bus wiring so as to sandwich said



insulating film therebetween, said spare wiring being superposed on said electrical conductor layers so as to sandwich said insulating film therebetween in a non-conductive state, and said connection region being coated by a protective coat so as to be isolated from said display medium.

5,151,808

CHIRAL SMECTIC LIQUID CRYSTAL ELECTRO-OPTICAL DEVICE HAVING DOMAINS FOR ALIGNMENT SMALLER THAN A PIXEL

Shunpei Yamazaki, Tokyo, and Masahiko Sato, Atugi, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

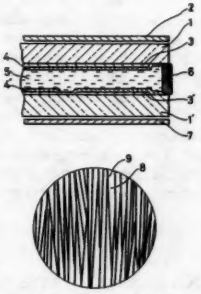
Division of Ser. No. 245,794, Sep. 19, 1988, Pat. No. 4,986,638. This application Oct. 31, 1990, Ser. No. 606,186

Claims priority, application Japan, Sep. 18, 1987, 63-234196; Jun. 24, 1988, 63-157703; Jun. 24, 1988, 63-157704

The portion of the term of this patent subsequent to Apr. 20, 2008, has been disclaimed.

Int. Cl.[5] G02F *1/13, 1/1337, 1/1343*

U.S. Cl. 359—78 **5 Claims**



1. A liquid crystal device comprising:

a pair of substrates;

a chiral smectic liquid crystal layer interposed between said substrates;

an electrode arrangement for applying an electric field to said liquid crystal layer; and

an orientation control surface formed on at least one inside surface of said substrates;

wherein said liquid crystal layer comprises a plurality of domains in each of which liquid crystal molecules are aligned in a direction which is determined by said orientation control surface.

5,151,809

MIRROR SUPPORT ARRANGEMENT FOR A PRIMARY MIRROR OF A TELESCOPE

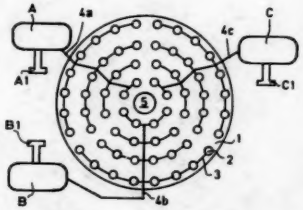
Hans-J. Meier, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Jul. 1, 1991, Ser. No. 722,884

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1990, 4021647

Int. Cl.[5] G02B *7/18, 5/08*

U.S. Cl. 359—846 **6 Claims**



1. A mirror support arrangement for a primary mirror of a telescope for non-earthbound vehicles, the mirror being subjected to forces acting laterally on the mirror, the mirror having an optical axis and having a rear side, the mirror support arrangement comprising:

said mirror having a plurality of first support points arranged in a raster on said rear side thereof and a plurality of second support points also arranged on said rear side;

an axial support system having a plurality of axial support elements acting at respective ones of said first support points to simulate a three-point axial support of said mirror;

a lateral support system having a plurality of hydraulic lateral support elements acting at respective ones of said second support points for distributing said forces to said second support points;

said hydraulic lateral support elements being arranged into first and second groups, the support elements of said first group acting in a first direction on said first support points and the elements of said first support points and the elements of said second group acting in a second direction on said second support points to define a V-support whereby lateral forces are taken up within a V-angle conjointly defined by said first and second directions; and,

rotation stop means for preventing said mirror from rotating about said optical axis.

5,151,810

METHOD FOR ALIGNMENT OF SCAN LINE OPTICS WITH TARGET MEDIUM

Douglass L. Blanding, Rochester; Michael E. Harrigan, Webster, and David Kessler, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 785,346, Oct. 31, 1991. This application Nov. 4, 1991, Ser. No. 786,339

Int Cl.[5] G02B *26/10*

U.S. Cl. 359—198 **16 Claims**

1. A method for positioning an optical system relative to a scan line receiving medium in a printer, or the like; the optical system being mounted on a frame and being suitable for generating a beam along a z (beam path) direction and scanning the same along a scan line in a y (scan) direction; and the receiving medium being supported for movement in an x (cross-scan) direction on the printer; the method being characterized in that it comprises the steps of:

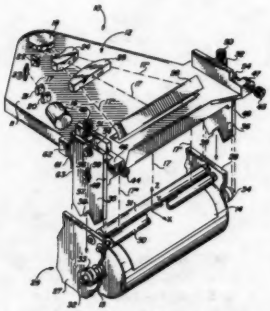
providing two curved surfaces on the printer;

providing two blocks attached to the frame, the blocks having upwardly-directed, inverted V-notches;

providing an alignment fixture having two curved surfaces,

relatively dimensioned, configured and adapted to correspond to the printer curved surfaces, and having a beam receiving element dimensioned, configured and adapted relative to the fixture curved surfaces to correspond to the position of the receiving medium relative to the printer curved surfaces;

placing the frame, with the blocks attached, onto the fixture with the block notches brought over the fixture curved surfaces;



selectively adjusting the positions of the blocks relative to the frame to establish a positional relationship between the scan line and the beam receiving element, corresponding to a desired positional relationship between the scan line and the receiving medium;

locking the blocks in their selectively adjusted positions relative to the frame; and

placing the frame, with the blocks locked, onto the printer, with the block notches brought over the printer curved surfaces.

5,151,811

LIGHT DEFLECTING APPARATUS

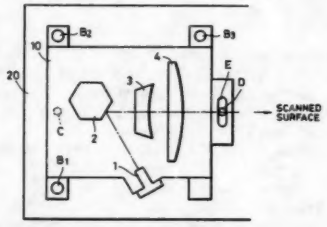
Jun Makino, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 512,197, Apr. 20, 1990, abandoned. This application Feb. 24, 1992, Ser. No. 839,715

Claims priority, application Japan, Apr. 24, 1989, 1-105455

Int. Cl.[5] G02B *26/08, 27/00*

U.S. Cl. 359—198 **31 Claims**



1. A light deflecting apparatus comprising:

an optical box;

a light source unit for emitting a light beam;

a light deflecting unit mounted in said optical box and capable of deflecting the light beam in a deflection plane to scan a surface with an image surface of the light beam;

an optical system mounted in said optical box and capable of converging the light beam deflected by said deflecting unit; and

a mounting base on which said optical box is rotatably mounted, wherein said optical box is mounted for rotation within the light deflection plane to adjust the inclination of the image surface with the surface to be scanned.

5,151,812

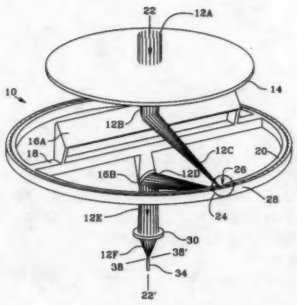
PASSIVE ENERGY DIAMETRIC SCANNER

Troy M. Watson, 5672 E. Kelso St., Tuscon, Ariz. 85712

Filed Aug. 30, 1991, Ser. No. 753,315

Int. Cl.[5] G02B *26/10*

U.S. Cl. 359—201 **14 Claims**



1. A diametric line scanner for sensing radiant energy intensity within a circular forward target field of view, comprising:

a first lens system adapted to collect radiant energy from the field of view and transmit the collected energy along a convergent primary beam so as to provide a first focal point at which a targeted object point in the field of view is focussed;

reflecting means in the vicinity of the first focal point adapted to reflect radiant energy of the primary beam and thus produce a divergent reflected secondary beam,

a second lens system adapted to converge the secondary beam into a convergent final beam path so as to provide a second focal point at which the point in the field of view is focussed;

a radiant-energy-sensitive cell located concentrically with the secondary beam at the second focal point, adapted to input to storage and processing means an electrical signal proportional to instantaneous energy intensity sensed; and

energy selection means, disposed between said first lens system and said second lens system and associated with said reflecting means, adapted to selectively expose said cell to radiant energy from the field of view in a manner to scan the field of view for localized energy level in continuous successive diametric scan lines, each starting at an edge of the field of view and progressing through a central point therein to an opposite edge, each scan line being advanced angularly about the central point by a predetermined angle.

5,151,813

METHOD AND APPARATUS FOR PRODUCING THREE-DIMENSIONAL OBJECTS

Masanobu Yamamoto, Kanagawa, and Kazumine Itoh, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 12, 1990, Ser. No. 492,607

Claims priority, application Japan, Mar. 14, 1989, 1-61422

Int. Cl.[5] G02B *26/08*; G11C *13/00*; B29C *35/08*

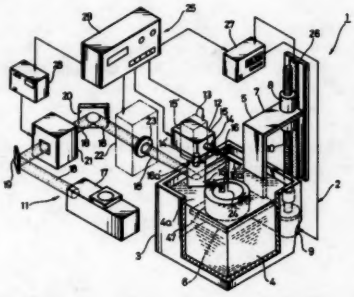
U.S. Cl. 359—202 **8 Claims**

6. A three-dimensional object producing apparatus including means for irradiating a beam on a liquid surface of a liquid photo-curable resin to form a succession of cured resin layers corresponding to successive cross-sectional laminae of a three-dimensional object and means for incrementally lowering the cured resin layers below the liquid surface as they are formed

to build up a three-dimensional copy of the object, the apparatus comprising:

(a) means for vector-scanning the beam on a first layer of photo-curable resin along one or more paths corresponding only to the contour or contours of a first one of the cross-sectional laminae of the object to thereby form a line or lines of cured resin in the shape of the contour or contours of a first one of the cross-sectional laminae of the object;

(b) means for lowering the line or lines of cured resin formed by the vector scanning means below the liquid surface by



a distance corresponding to the thickness of one crosssectional lamina of the three-dimensional object to thereby flow a layer of photo-curable liquid resin to cover the line or lines of cured resin;

(c) means for thereafter raster-scanning the beam on the layer of photo-curable resin covering the line or lines of cured resin; and

(d) wherein the vector-scanning means, the means for lowering, an the raster-scanning means operate repeatedly and sequentially until a complete copy of the object is thereby produced.

5,151,814

PHASED ARRAY FOR OPTICAL BEAM CONTROL

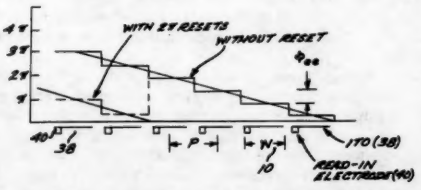
Jan Grinberg, Los Angeles; Thomas R. O'Meara, Malibu; Yuri Owechko, Newbury Park; Melvin E. Pedinoff, Thousand Oaks, and Bernard H. Soffer, Pacific Palisades, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 420,077, Oct. 10, 1989, abandoned, which is a division of Ser. No. 87,173, Aug. 19, 1987, abandoned.

This application Mar. 18, 1991, Ser. No. 673,175

Int. Cl.[5] G02B *26/08*

U.S. Cl. 359—209 **5 Claims**



1. A method of steering an optical beam incident on an array of a plurality of beam deflection elements, having a refractive medium, first and second drive electrodes in contact with a third electrode disposed on one side of said medium and a fourth electrode disposed on an opposed side of said medium, comprising the steps of:

applying drive voltages to said first and second drive electrodes for progressively linearly shifting the phase of the optical beam across the beam diameter in a direction perpendicular to the beam propagation direction; and

selecting said linear phase shifts according to the progressions;

$\phi'(n)=2\pi[nw\tan(\alpha)-K(n)\lambda]\lambda$

$\phi''(n)=2\pi[(n+1)w\tan(\alpha)-K(n)\lambda]\lambda$

where:

α is the desired deflection angle;

$\phi'(n)$ and $\phi''(n)$ are the phases introduced at the first and second electrodes located at the ends of the n^{th} element of the array;

w is the width of each element of the array

λ is the wavelength of the propagating beam

K(n) is the integer representing the number of wavelengths to be subtracted from the n^{th} element;

wherein said drive voltages are applied to first and second drive electrodes associated with each of said elements to linearly distribute the voltages between said first and second drive electrodes so as to create a linear phase change between said first and second drive electrodes and individually control the angle of deflection and phase shift induced by each of said elements in the optical beam such that the phase jump between abutting end points of adjacent elements in an integral number of the wavelength of the optical beam, and

the optical beam is steered as a spatially phase coherent deflected beam.

5,151,815

SCANNING DEVICE AND APPLICATION THEREOF TO ANALYSIS DEVICES

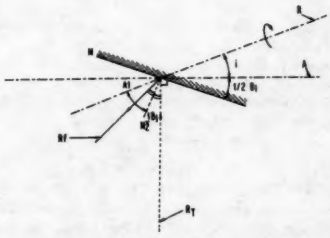
Gérard Baillet, St Benoit Vienne, France, assignor to SAT (Societe Anonyme de Telecommunications), Paris, France

Filed Dec. 26, 1990, Ser. No. 633,625

Claims priority, application France, Dec. 26, 1989, 89 17166

Int. Cl.[5] G02B *26/10*

U.S. Cl. 359—220 **25 Claims**



1. A system for scanning a light beam comprising:

reflecting means M receiving a rotating incident beam R_T at an angle of incidence $\frac{1}{2}B_1$ to provide a reflected beam R_f, said reflecting means M being movable about an axis of rotation R, the reflected beam R_f being fixed in space, in which system the axis of rotation R of said reflecting means M forms an angle i with a perpendicular A to a scanning plane P_f of said rotating incident beam R_T.

5,151,816

METHOD FOR REDUCING CURRENT LEAKAGE AND ENHANCING UV STABILITY IN ELECTROCHEMICHROMIC SOLUTIONS AND DEVICES

Desaraju V. Varaprasad; Hamid R. Habibi; Niall R. Lynam, and Padma Desaraju, all of Holland, Mich., assignors to Donnelly Corporation, Holland, Mich.

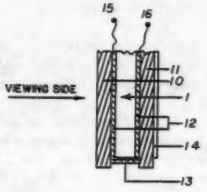
Filed Dec. 29, 1989, Ser. No. 458,969

Int. Cl.[5] G02F *1/01*

U.S. Cl. 359—275 **31 Claims**

1. A method for reducing leakage current and enhancing

UV stability/in an electrochemichromic cell having spaced plates, each having an inwardly facing conductive surface, and a solution located in said cell between said plates, said solution comprising a redox chemical pair which colors in the presence



of an applied voltage and which bleaches to a colorless condition in the absence of an applied voltage said method comprising:

using a solvent for said redox chemical pair comprising at least 25% by volume glutaronitrile.

5,151,817

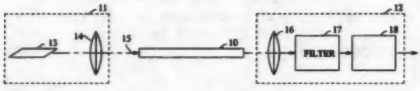
OPTICAL FREQUENCY SECOND HARMONIC GENERATOR

Denise M. Krol, Murray Hill, and Jay R. Simpson, Fanwood, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 8, 1991, Ser. No. 697,054

Int. Cl.[5] G02F *1/37*

U.S. Cl. 359—328 **9 Claims**



1. A source of light of a desired frequency 2f comprising:

a waveguiding body of glass doped with cerium;

an optical input source of light at frequency f for directing an input beam into said body of glass; and

utilization means for receiving light passing through said body and utilizing light at frequency 2f.

5,151,818

SEMICONDUCTOR OPTICAL AMPLIFIER

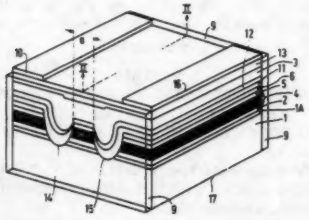
Petrus J. A. Thijs, and Lukas F. Tiemeijer, both of Eindhoven, Netherlands, assignors to U. S. Philips Corp., New York, N.Y.

Filed Jul. 30, 1991, Ser. No. 738,062

Claims priority, application Netherlands, Aug. 3, 1990, 9001761

Int. Cl.[5] H01S *3/25, 3/19*; C02F *3/00*

U.S. Cl. 359—344 **9 Claims**



1. An optical amplifier having at least a semiconductor body comprising a substrate of a first conductivity type and at least a semiconductor layer structure situated thereon and comprising at least a first passive layer of the first conductivity type, a second passive layer of the second, opposite conductivity type, and between the first and the second passive layer an active layer and a pn junction, amplification of electromagnet radiation within a wavelength range taking place at at least a selected current strength in the forward direction through the pn junction within a strip-shaped amplification region of the active layer, which has a greater effective refractive index and a smaller bandgap for the radiation to be amplified than the first and second passive layers, which comprises a plurality of quantum well layers of a semiconductor material having a direct band transition and being mutually separated by barrier layers of a different semiconductor material, and in which a first portion of the quantum well and barrier layers which form part of the active layer are under tensile stress, the strip-shaped amplification region being bounded in the longitudinal direction by end faces which serve as input and output surfaces for the radiation to be amplified and which are of low reflection, the second passive layer and the substrate being electrically connected to connection conductors, characterized in that a second portion of the quantum well and barrier layers which form part of the active layer are under compressive stress.

5,151,819

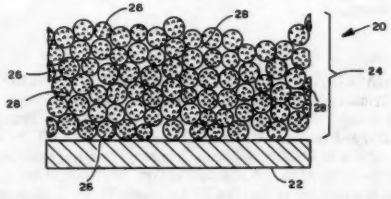
BARRIER FOR SCATTERING ELECTROMAGNETIC RADIATION

Richard B. Stephens, Del Mar, Calif., assignor to General Atomics, San Diego, Calif.

Continuation-in-part of Ser. No. 283,289, Dec. 12, 1988, abandoned. This application Jul. 27, 1990, Ser. No. 558,600

Int. Cl.[5] G02B *5/02*; B64G *1/54*

U.S. Cl. 359—350 **15 Claims**



1. A barrier supported by an object, such as a satellite or missile for use in space, for scattering a coherent beam of electromagnetic radiation having a wavelength in a predetermined range of wavelengths, said predetermined range being within, but not necessarily fully including, the range of about 0.2 micron to about 11 microns and with said radiation emanating from a distant source of such radiation, said barrier comprising:

a non-metallic layer formed by a multiplicity of first components arranged in close proximity with each other and a multiplicity of second components, each of said component s being disposed in the gaps formed between said first components, one of said components having a relatively low index of refraction such as for a vacuum or air and the other of said components having a substantially higher index of refraction, the optical thickness of at least a majority of said first components and at least a majority of said second components being within an order of magnitude of the wavelength of said radiation, both of said components being transparent at said wavelength, said layer having a thickness between about 0.2 micron and 1000 microns.

5,151,820
ZOOM LENS

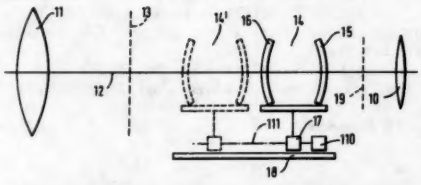
Hilary G. Sillitto, West Lothian, and Alison B. Lessels, Edinburgh, both of United Kingdom, assignors to GEC Ferranti Defence Systems Limited, Stanmore, United Kingdom

Filed May 2, 1991, Ser. No. 694,298

Claims priority, application United Kingdom, May 18, 1990, 9011160

Int. Cl.[5] G02B *15/00*

U.S. Cl. 359—354 9 Claims



1. A zoom lens for use in an infra-red telescope and providing a magnification which is adjustable to either of two predetermined values and comprising a pair of positive lens elements fixed relative to one another and each having an aspheric surface, the pair of lens elements being locatable between the two image planes formed in the telescope and being movable between two conjugate positions.

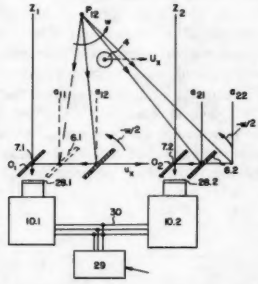
5,151,821
SYSTEM AND DEVICES FOR TIME DELAY 3D

Mortimer Marks, 166-17 Cryders La., Whitestone, N.Y. 11357

Filed Oct. 25, 1990, Ser. No. 604,089

Int. Cl.[5] G02B *27/22*

U.S. Cl. 359—462 20 Claims



1. A panning-camera for the recording of time delay three dimensional images of objects in a scene, an arbitrary fixed point P in said scene, said panning-camera comprising a camera, a lens on said camera, said lens having a center C on its optical axis OZ, a deflector A having a reflecting plane at 45° intersecting said optical axis at point O, said point O being the origin of OXYZ rectangular coordinates with its OX axis horizontal, a second deflector B, a first means for respectively rotating and translating said deflector B with an angular velocity $-\omega/2$, and a linear velocity u_x, a mounting, said camera and said means being attached to said mounting, said deflector B having a reflecting plane intersecting the said OX axis at point R where $x=a$, the angle OPR being defined as $\theta=a/r$ radians, where r=distance PR from point R to said fixed object point P, and the angular velocity of said panning about said fixed point P being $(d\theta/dt)=\omega$, the plane of said deflector B making an angle of $(45°-\theta/2)$ between its normal RQ and the OX axis, said means rotating said deflector B with an angular velocity $-\omega/2$ from θ_1 to θ_2 about an axis parallel to the OY axis through point R, and simultaneously translating said point R on deflector B along the said OX axis with linear velocity $u_x=\pm\omega r$, from a minimum distance $x=a_1$ to a maximum distance $x=a_2$, said first means periodically returning said deflector to the position where $x=a_1$ and $\theta=\theta_1$, whereby said scene is continuously panned by said panning-camera relative to said optical axis OZ, thereby encoding in said recording a time-delay three dimensional image of said scene.

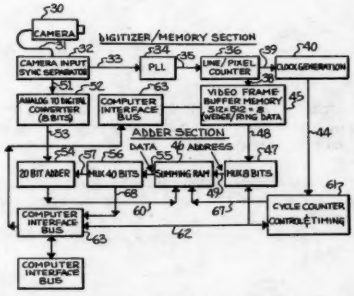
5,151,822
TRANSFORM DIGITAL/OPTICAL PROCESSING SYSTEM INCLUDING WEDGE/RING ACCUMULATOR

Roeland M. T. Hekker, Fairfield, Iowa; Izhak M. Livny, and Gregory S. Mercurio, both of San Jose, Calif., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 920,513, Oct. 17, 1986, abandoned. This application Mar. 19, 1990, Ser. No. 497,878

Int. Cl.[5] G02B *27/46;* G06K *9/76, 9/36;* G06E *3/00*

U.S. Cl. 359—559 62 Claims



1. An apparatus for detecting the transform of an image comprising:

means for generating a transform image from an image;

means for generating a relatively large number of transform digital data points from the transform image, each transform digital data point including an area portion digital data value identifying an area located within the transform image, and a corresponding feature portion digital data value identifying a feature of the transform image in the located area;

means for associating each of said relatively large number of transform digital data points with at least one of a relatively small number of zones, in response to the area portion digital data value associated with the transform digital data point, such that the associated zone includes the located area of the transform image represented by the corresponding transform digital data points;

means for generating a summed transform digital data value for each of said relatively small number of zones, each summed transform digital data value being the cumulation of any previous feature portion digital data values for the predetermined zone, to obtain a relatively small number of summed transform image data values representing said relatively large number of transform digital data points; and

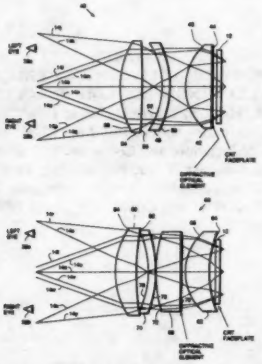
means for retrievably storing the summed transform image data value for each predetermined zone, to detect the transform of said image from said relatively small number of summed transform image data values, rather than said relatively large number of transform composite digital data points.

5,151,823

BIOCULAR EYEPIECE OPTICAL SYSTEM EMPLOYING REFRACTIVE AND DIFFRACTIVE OPTICAL ELEMENTS

Chungte W. Chen, Irvine, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 23, 1991, Ser. No. 764,285
Int. Cl.[5] G02B *5/18, 3/02, 3/08, 9/14*
U.S. Cl. 359—565 **17 Claims**



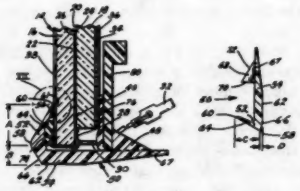
1. A biocular eyepiece optical system comprising:
a first optical element having at least one diffractive surface;
a second optical element having at least one refractive surface;
a third optical element having at least one refractive surface;
the first, second, and third optical elements being generally disposed along an optical axis; and
wherein the second optical element is optically intermediate the first and third optical element.

5,151,824

VEHICULAR OUTSIDE MIRROR ASSEMBLY

Desmond J. O'Farrell, Holland, Mich., assignor to Donnelly Corporation, Holland, Mich.

Filed Nov. 26, 1990, Ser. No. 618,169
Int. Cl.[5] G02B *17/00*
U.S. Cl. 359—604 **35 Claims**



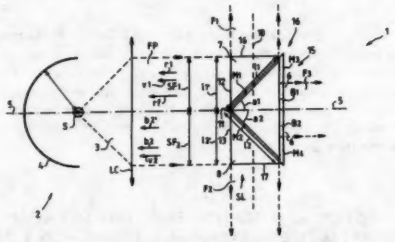
12. A rearview mirror assembly for vehicles comprising:
a rearview mirror including a mirror element having front and rear surfaces and peripheral top, bottom and opposing end edges and a reflective coating on one of said front and rear surfaces;
a bezel surrounding and holding said mirror and having a rim engaging said front surface of said mirror, a peripheral side adjacent said peripheral edges of said mirror, and means for holding said mirror within said bezel; and
mounting means for connection to a mirror support;
said bezel rim having a first width along said front mirror surface adjacent said top and bottom edges, the width of said bezel rim along said opposing end edges being less than said first width whereby when viewed at an angle from the front and adjacent one end, said bezel appears smaller at said end edges of said mirror thereby deemphasizing the size and appearance of said bezel on said assembly.

5,151,825

DEVICE FOR THE GENERATION OF SEVERAL BEAMS OF LIGHT INCLUDING A LIGHT SPLITTER

Christophe Nicolas, Paris, France, assignor to Thomson-CSF, Puteaux, France

Filed Sep. 19, 1991, Ser. No. 762,372
Claims priority, application France, Sep. 28, 1990, 90 11991
Int. Cl.[5] G02B *27/14, 5/28*
U.S. Cl. 359—634 **13 Claims**



1. A light beam generator device, comprising a light source producing a light beam called a primary beam, the spectrum of which is substantially that of visible light, a light splitter illuminated by the primary beam and producing, in return, at least two secondary beams corresponding to different wavelengths, the first and second of the secondary beams being obtained respectively by means of a first mirror and second mirror that are selective in wavelength, wherein the first and second selective mirrors are positioned so as to intercept different parts of the section of the primary beam, and wherein the light splitter further has a rear face at least partially constituting a total mirror, the rear face being, firstly, located opposite the light source with respect to the first and second selective mirrors and being, secondly, in a plane perpendicular to an axis of propagation of the primary beam.

5,151,826

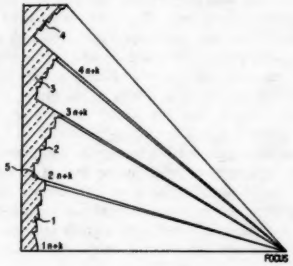
FRESNEL LENS

Ian K. Pasco, Bracknell, Great Britain, assignor to Combined Optical Industries Limited, Slough, United Kingdom

Continuation of Ser. No. 439,641, Nov. 20, 1989, abandoned.
This application Mar. 8, 1991, Ser. No. 668,814
Claims priority, application United Kingdom, Oct. 16, 1989, 8923265
Int. Cl.[5] G02B *3/08*
U.S. Cl. 359—742 **7 Claims**

1. A fresnel lens comprising a plate having a plurality of zones, a plurality of facets in each zone so dimensioned and configured that the distance between a face of the lens for each facet and a focal point of the lens on the same side thereof as said face is $(n+k)\lambda$ where n is an integer, λ is the wavelength of radiation passing through the lens and k is a fraction between 0 and 1 which is substantially constant for every facet across the entire face of the lens, the integer n being constant

for all the facets of each zone, with the integer n being different for the facets of different zones, respectively, whereby the



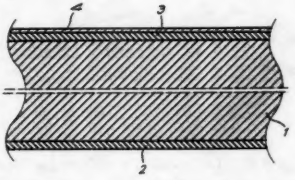
radiations from all of said zones arrives at said focal point substantially in phase.

5,151,827

SELF-SUPPORTING MIRROR AND METHOD FOR THE MANUFACTURE THEREOF

Kari K. M. Ven; Petri A. G. Ven; Irja L. L. M. Ven; Timo Ven, all of Antwerp, and Juha Ven, Brasschaat, all of Belgium, assignors to Aurinco Holdings Limited, Guernsey, Channel Islands

Filed May 17, 1991, Ser. No. 701,837
Claims priority, application Belgium, May 18, 1990, 9000527
Int. Cl.[5] G02B *5/08*
U.S. Cl. 359—848 **6 Claims**



1. A method for manufacturing a mirror for the utilization of solar rays, comprising the steps of:
preparing a core composed of hard foam and having two sides;
gluing protective coverings on both sides of said core under a vacuum; and
applying a reflective foil to at least one of said protective coverings.

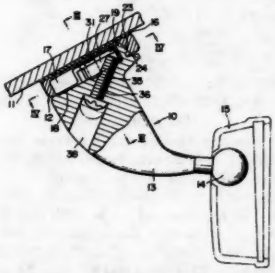
5,151,828

INSIDE REAR VIEW MIRROR FOR A VEHICLE

Naomi Sugimura, Shimada, Japan, assignor to Ltd. Murakami Kaimeido Co., Shizuoka, Japan

Filed Jun. 4, 1990, Ser. No. 532,966
Claims priority, application Japan, Jul. 14, 1989, 1-82152[U]
Int. Cl.[5] B60R *1/04*
U.S. Cl. 359—871 **7 Claims**

1. An inside rear view mirror for a vehicle, comprising:
a base to be secured to an interior surface of a vehicle and having a bottom surface and a cavity formed in said bottom surface;
a stay detachably mounted on said bottom surface of said base and having an upper surface;
a frame arranged at said upper surface of said stay and received in said cavity, said base having an inside wall surface defining said cavity and having a first semi-spherical dent arranged in the center of said inside wall surface and two second semi-spherical dents formed, respectively at opposite positions of said inside wall surface equally spaced from the center of said inside wall surface, said frame having a front end and a semi-spherical projection formed at said front end for engaging said first semi-spherical dent;
elastic engaging means comprising an arc-shaped leaf spring to be located in said frame and two stoppers arranged at opposite sides of said frame, respectively;



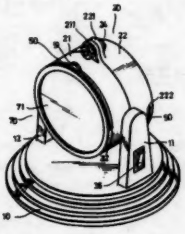
said elastic engaging means arranged in said frame to provide for engagement of said two stoppers in said two second semi-spherical dents, respectively; and
each of said two stoppers elastically engaging a respective end of said leaf spring and having a semi-spherical convex projecting through a respective end portion of said frame for engaging said respective second semi-spherical dent.

5,151,829

KINETIC ART ARTICLE ASSEMBLY WITH STACKED COLOR FILTERS

Ren-Yi Hwang, 2nd Floor, 9-1, Lane 161, Hsing An Road, Sec. 1, Tachung, Taiwan

Filed Jun. 24, 1991, Ser. No. 722,237
Int. Cl.[5] G02B *5/24; G04F 13/24*
U.S. Cl. 359—886 **5 Claims**



1. A kinetic art article assembly with stacked color filters comprising:
a base;
two support plates on the top of said base;
a cylindrical main body supported by said two support plates;
a front main body and a rear main body defined by said cylindrical main body;
a fluid governor disposed in said cylindrical body and between said front main body and said rear main body;
a drive mechanism disposed in said base for controlling the motion of said cylindrical main body;
at least a plate assembly disposed in said front main body and said rear main body;
said plate assembly comprising a front plate, a flat plate, and a rear plate;
said front plate having a first recess therein;

said rear plate having a corresponding second recess therein;

a first tube disposed on the rim of said flat plate with a liquid capable of flowing from said first tube to said first recess;

a second tube disposed on the rim of said rear plate with a liquid capable of flowing from said second tube to said second recess;

Wherein each of said front plate, flat plate, and rear plate of said front main body has a hole being passed through by said correcponding tubes of said rear main body and each of said front plate, flat plate, and rear plate of said rear main body has a hole being passed through by said corresponding tubes of said front main body.

5,151,830

MAGNETIC RECORDING AND REPRODUCING APPARATUS AND METHOD OF RECORDING AND REPRODUCING

Kenji Goto; Manabu Tsukamoto; Masayuki Ishida, and Yoshinobu Ishida, all of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

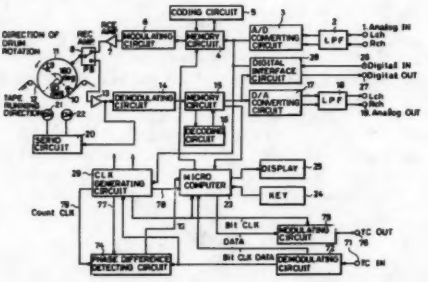
Continuation of Ser. No. 448,722, Dec. 11, 1989, Pat. No. 5,097,364. This application Oct. 9, 1991, Ser. No. 773,832

Claims priority, application Japan, Dec. 12, 1988, 63-314232; Dec. 22, 1988, 63-327035; Mar. 22, 1989, 1-71090; Mar. 23, 1989, 1-73129; Mar. 23, 1989, 1-73130; Mar. 24, 1989, 1-72625; Apr. 4, 1989, 1-86028; Apr. 14, 1989, 1-95682; May 12, 1989, 1-119248; Dec. 7, 1989, 1-318522

The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—32 **2 Claims**



1. A magnetic recording and reproducing apparatus dividing inputted main signals at every prescribed frame period to process said divided main signals as 1 frame data to record the same on a prescribed area of a magnetic tape and recording sub signals in a different area of said magnetic tape, and reproducing the recorded main signals and sub signals, comprising:

information extracting means receiving time code signals having a frame period different from that of said main signals for extracting first time information included in said time code signals;

phase difference detecting means for detecting phase difference between a point of change of frames of said main signals and a point of change of frames of said time code signals by prescribed clock signals;

arithmetic means, in recording, responsive to the first time information extracted by said information extracting means and to the phase difference information detected by said phase difference detecting means for calculating second time information using said prescribed frame period as a minimum unit, and for calculating initial phase difference information between head of a frame as a reference of said time code signals and head of a frame of said main signals positioned at the frame as the reference of said time code signals, and in reproduction, for calculating said first time information and the phase difference information from said second time information and said initial phase difference information;

recording and reproducing means for recording, in recording, said second time information calculated by said arithmetic means, said initial phase difference information, and frequency identifying information indicative of the frequency of the said prescribed clock signals used for detecting said phase difference information in said sub signal recording area, and for reproducing, in reproduction, said second time information, said initial phase difference information, and said frequency identifying information from said sub signal recording area; and

time code signal generating means for composing a series of data of a prescribed transmission format of said time code signal based on said first time information calculated by said arithmetic means and for outputting the series of data of said composed time code signals in response to said phase difference information calculated by said arithmetic means.

5,151,831

DIGITAL SIGNAL PROCESSING CIRCUIT

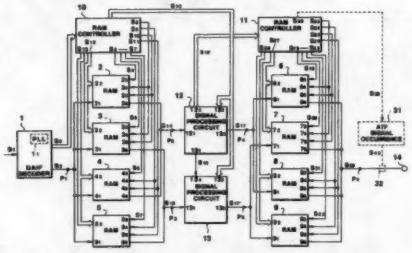
Hitoshi Narusawa, and Michiaki Yoneda, both of Tokyo, Japan, assignors to Nakamichi Corporation, Kodaira, Japan

Filed Apr. 23, 1990, Ser. No. 513,236

Claims priority, application Japan, Apr. 28, 1989, 1-110344

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—39 **4 Claims**



1. A digital signal processing circuit comprising:

first and second memory groups each including first through n_{th} memory means to sequentially store digital data of transmission rate t input by a frame unit;

first control means to control said first and second memory groups so that said first through n_{th} memory means in one of said first and second memory groups simultaneously output the stored digital data at transmission rate t/n while said first through n_{th} memory means in the other of said first and second memory groups store said sequential digital data;

first through n_{th} signal processing means to sequentially signal-process digital data of n systems alternately output from said first and second memory groups on a format of DAT, respectively;

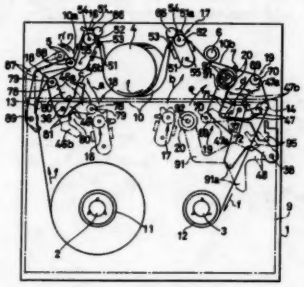
third and fourth memory groups each including first through n_{th} memory means to alternately store the data signal-processed by said signal processing means, respectively;

and second control means to control said third and fourth memory groups so that said first through n_{th} memory means in one of said third and fourth memory groups output the stored digital data signal processed by said signal processing means at a velocity n times as great as that on memory in a predetermined sequential manner while said first through n_{th} memory means in the other of said third and fourth memory groups store the data signal processed by said signal processing means output from said first through n_{th} signal processing means.

5,151,832
TAPE LOADING DEVICE

Tsuyoshi Nagasawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1990, Ser. No. 625,950
Claims priority, application Japan, Dec. 26, 1989, 1-337002
Int. Cl.[5] G11B *5/027*
U.S. Cl. 360—85 16 Claims



1. A tape loading device for use with a magnetic tape cassette, comprising:

rotary head drum means around which a magnetic tape is wrapped at a predetermined angle of contact and having a rotary head for recording and/or reproducing information from the magnetic tape;

tape loading means arranged for reciprocating movement to wrap the magnetic tape around the head drum means and withdraw the magnetic tape from around the head drum means, the magnetic tape being withdrawn from the tape cassette to be wrapped around the head drum means at the predetermined angle of contact;

a capstan motor rotatable in both normal and reverse directions to drive a capstan means so that the magnetic tape travels at a constant speed;

drive gear means driven by the capstan motor;

partially toothless gear means facing the drive gear means so as to be intermittently rotated thereby, and having a cam mechanism for causing the tape loading means to reciprocate over a predetermined distance;

a mode changing mechanism for changing the mode of the tape loading device;

a mode motor rotatable in both normal and reverse directions for putting the mode changing mechanism in action in correspondence with an angle of rotation thereof; and

trigger means for mechanically triggering a predetermined amount of rotation of the partially toothless gear, wherein the trigger means is driven due to torque of the mode motor so as to mesh the partially toothless gear with the drive gear means, the partially toothless gear is rotated due to torque of the capstan motor, and the tape loading means is reciprocated due to motion of the cam mechanism of the partially toothless gear.

5,151,833
MAGNETIC TAPE DEVICE HAVING A SWITCHING MECHANISM FOR DIVERTING ROTATION OF THE CAPSTAN TO ROTATION FOR LOADING/UNLOADING A CASSETTE IN THE DEVICE

Yasuyuki Nakanishi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1990, Ser. No. 579,972
Claims priority, application Japan, Sep. 12, 1989, 1-234745; Sep. 13, 1989, 1-235815; Sep. 19, 1989, 1-240553
Int. Cl.[5] G11B *5/027*
U.S. Cl. 360—85 9 Claims

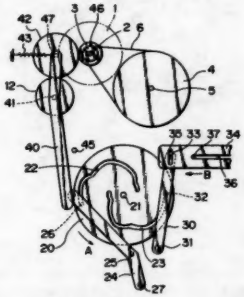
1. A magnetic tape device for loading a tape cassette and for feeding and loading the magnetic tape in the tape cassette toward a rotary drum, comprising:

a capstan motor having a motor shaft operatively connected to a capstan;

a motor gear mounted on said motor shaft of said capstan motor;

a cam gear operatively connected to a drive motor so as to operate a tape loading mechanism for drawing out the magnetic tape from the tape cassette when the tape cassette is in a cassette playing position;

a movably mounted moving gear for engaging said motor gear to transmit rotation of said motor shaft to a cassette loading mechanism for moving a tape cassette to the cassette playing position; and



a first pivotal lever rotatably supported on a fixed axis and having said moving gear mounted for rotation thereon, said lever being operatively associated with said cam gear such that rotation of said first pivotal lever is is dependent upon the amount of rotation of said cam gear, whereby when said tape loading mechanism is in an inoperative position, said moving gear meshes with said motor gear to transmit rotation from said motor shaft to said cassette loading mechanism, and when said tape loading mechanism is moved to an operative position, said moving gear is brought out of meshing engagement with said motor gear.

5,151,834
BRAKE RELEASING MECHANISM OF DUPLEX TAPE RECORDER

Satoru Koizumi, Higashi Hiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Jun. 12, 1990, Ser. No. 536,799
Claims priority, application Japan, Jun. 30, 1989, 1-170662
Int. Cl.[5] G11B *15/68, 15/48, 5/008;* B65H *16/10*
U.S. Cl. 360—92 9 Claims

1. A duplex tape recorder which holds two tape cassettes laid one over another for recording and reproducing, the duplex tape recorder comprising:

a first reel engagable with an upper tape cassette for driving a tape in the upper tape cassette;

a second reel which is coaxial with the first reel and engagable with the lower tape cassette for driving a tape in the lower tape cassette;

cassette holder means for holding the upper and lower tape cassettes laid one over another, the cassette holder means being movable between a first position in which the upper and lower tape cassettes can be removed therefrom and a second position in which the upper and lower tape cassettes can engage the first and second reels, respectively;

mode selecting means for selecting one of a plurality of modes, the modes including a T_1 mode in which reproduction is performed only for the upper tape cassette, a T_2 mode in which reproduction is performed only for the

lower tape cassette, and a dubbing mode in which recorded output of one of the tape cassettes is recorded by the other tape cassette;

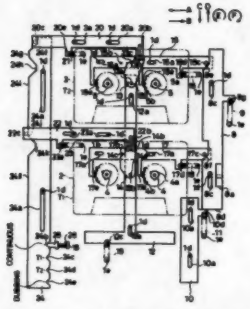
locking means for locking the cassette holder means in the second position;

eject means for releasing the locking means;

first braking means for braking the rotation of the first reel;

second braking means for braking the rotation of the second reel;

brake preset means for presetting the first and/or second braking means in accordance with the mode selected by the mode selecting means;



first brake releasing means for releasing the first and second braking means in response to the operation of the eject means;

tape-driving mode means which is driven with the operation for driving the upper and/or lower cassettes; and,

second brake releasing means for releasing braking force exerted on one of the first and second reels which drives the tape in correspondence with the preset state of the first and/or second braking means by the brake preset means, when the tape-driving mode means is operated.

5,151,835

CASSETTE DETECTING DEVICE FOR CASSETTE LOADING MECHANISM

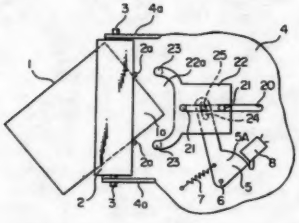
Yasuyuki Nakanishi, Sanda, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 17, 1990, Ser. No. 623,444

Claims priority, application Japan, Apr. 25, 1989, 1-103415

Int. Cl.[5] G11B *5/008, 17/02*

U.S. Cl. 360—96.5 **12 Claims**



1. A cassette detecting device, for use with a cassette loading mechanism having a frame and a cassette holder movably disposed on said frame,

said cassette detecting device comprising:

a detecting member movably supported on the frame, said detecting member being urged into an actuated position by a leading edge of a cassette inserted into the cassette holder in a push-in position;

biasing means for biasing said detecting member into a predetermined position; and

a detecting element responsive to movement of said detecting member for controlling a cassette loading device;

said detecting member further including engagement portions for engaging with leading edge of a cassette at two positions spaced apart from each other, said engagement portions defining therebetween a space for receiving therein a corner portion of a cassette when the cassette is not properly held within a cassette holder and for disabling said detecting member into said actuated position.

5,151,836

DISK CHUCKING DEVICE

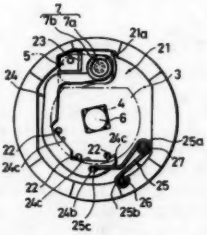
Akira Ichihara, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1991, Ser. No. 672,813

Claims priority, application Japan, May 31, 1990, 2-56579[U]

Int. Cl.[5] G11B *17/022*

U.S. Cl. 360—99.08 **1 Claim**



1. A disk chucking device comprising:

a driving shaft engaged with a central hole formed in an information recording disk;

a turn table mounted on said driving shaft so as to rotate together with said driving shaft;

a plurality of holding pins disposed on said turn table and protruding therefrom;

a plate spring, comprising of a first and a second end portions, wherein a side edge of the first end portion is brought into contact with said holding pins, a driving pin engaged with a driving pin engaging hole formed at a position deviated from a center of the said information recording disk, said driving pin being disposed on the second end portion of said plate spring; and

elastic energizing means for elastically energizing the first end portion of said plate spring towards said holding pins.

5,151,837

COMPOSITE MAGNETIC HEAD

Makoto Wakasugi, and Takao Kasai, both of Saitama, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 8, 1991, Ser. No. 638,766

Claims priority, application Japan, Jan. 12, 1990, 2-5981; Mar. 13, 1990, 2-60095

Int. Cl.[5] G11B *5/11, 5/60*

U.S. Cl. 360—103 **17 Claims**

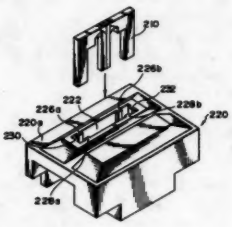
1. A magnetic head comprising:

a) a core chip formed of magnetic material and including a plurality of gaps formed therein at the side of the core chip to contact a magnetic recording medium;

b) a slider including an aperture receiving said core chip, said aperture being opened at the surface of said slider and having longer and shorter side inner walls on which at least more than one protrusion extending into said aperture from said inner walls for positioning and constraining said core ship within said aperture are formed;

c) a fusible member in a clearance between said aperture and said core chip received in said aperture, said core chip

being welded to the inner walls of said aperture by said fusible member; and



d) a layer of non-magnetic material provided on said inner walls of said aperture.

5,151,838

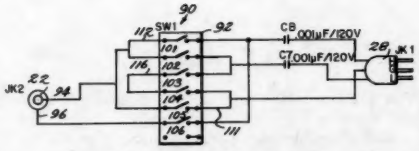
VIDEO MULTIPLYING SYSTEM

Gregory A. Dockery, 1938 Port La., Amarillo, Tex. 79106

Filed Sep. 20, 1989, Ser. No. 409,667

Int. Cl.[5] H04M *11/04*

U.S. Cl. 340—310 R **26 Claims**



1. A receiver for processing a video signal from a power line, comprising:

three input lines connected to a standard power adaptor, at least one input line carrying the video signal;

two output lines;

a processing means comprising conductive elements including switching means and arrangements of conductive paths in which

1) a first of said three input lines is connected to said switching means by multiple branch lines,

2) the second and third of said three input lines are connected to said switching means by multiple branch lines,

3) a first of said two output lines is connected to said switching means by multiple branch lines,

4) the second of said two output lines is connected to said switching means,

the switching means facilitates the selection of alternates of said conductive paths and said conductive elements to pass the video signal from the at least one input line carrying the video signal to at least one of said output lines thereby tuning the impedance of the receiver, and

the processing means enables the simultaneous electrical connection via said conductive elements of one of the output lines with two of the input lines.

5,151,839

CURRENT TRANSMITTING MECHANISM IN MAGNETIC RECORDING AND REPRODUCING APPARATUS

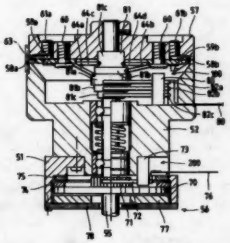
Hiroyuki Ota, Yonezawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 10, 1990, Ser. No. 625,240

Claims priority, application Japan, Jun. 6, 1990, 2-147951

Int. Cl.[5] G11B *5/52*

U.S. Cl. 360—108 **9 Claims**



1. A current transmitting mechanism to be mounted on a magnetic recording and reproducing apparatus having a magnetic head secured to a rotary drum, comprising:

a slip ring rotatable together with the rotary drum; and

a brush placed in contact with said slip ring in an electrically conductive manner so as to transmit an electric current signal from said slip ring, said brush comprising a brushing element made of an electrically conductive material contacting said slip ring, a support member for supporting said brushing element at a base end thereof and an elastic member secured to said brushing element on a side not contacting said slip ring, said elastic member having an elasticity different from that of said brushing element.

5,151,840

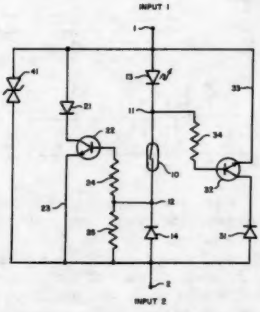
SWITCH PROTECTION CIRCUIT

Allen J. Siefken, Lake Oswego, Oreg., assignor to RAJ Industries, Inc., Lake Oswego, Oreg.

Filed Sep. 11, 1990, Ser. No. 580,639

Int. Cl.[5] H01H *9/30*

U.S. Cl. 361—13 **22 Claims**



1. A switch protective apparatus for protecting a switch device in a circuit having a first and a second input wherein the switch device controls the AC and DC electrical connection between said first and second inputs comprising:

switch means for providing a mechanical switch device to be protected in a primary branch between said first and said second input;

first diode means intermediate and in series with said switch

means and said first input for uni-directionally controlling the flow of current in said primary branch;

second diode means intermediate and in series with said switch means and said second input for uni-directionally controlling the current in said primary branch, and the polarity of said second diode means being opposite the polarity of said first diode means, thereby said primary branch comprises said first diode means connected directly from said first input directly to said switch means and said switch means connected directly to said second diode means and said second diode means connected directly to said second input;

a first parallel path between said first input and said second input and having a first controlled switching means for providing a low resistant current path between said first input and said second input when the polarity between said first and second input is the same as the polarity of said first diode means, and said switch means is in a closed position;

a second parallel path between said first input and said second input having a second controlled switching means for providing a current path between said first input and said second input when the polarity between said first and second inputs is the same as the polarity of said second diode means, said switch means is in a closed position; and

substantially all steady state load current is conducted through said first parallel path and said second parallel path when said switch means is maintained in a closed position and said first parallel path and said second parallel path cease to conduct steady state current when said switch means is maintained in an open position.

5,151,841

ELECTRICAL SAFETY APPARATUS

Douglas S. Knights, Sawbridgeworth, United Kingdom, assignor to B & R Electrical PLC, Harlow, England

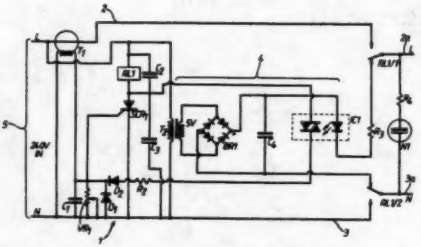
PCT No. PCT/GB89/00560, § 371 Date Mar. 21, 1990, § 102(e) Date Mar. 21, 1990, PCT Pub. No. WO89/11747, PCT Pub. Date Nov. 30, 1989

PCT Filed May 22, 1989, Ser. No. 458,613

Claims priority, application United Kingdom, May 23, 1988, 8812151

Int. Cl.[5] H02H *3/18, 3/26, 3/42*

U.S. Cl. 361—86 **26 Claims**



1. An electrical safety apparatus for connection between an electrical power source and a load, comprising:

controllable connection means transferable between a first condition, in which the electrical power source is connected to the load, and a second condition, and including a switching means having one pole connected to each terminal of the load for switching connections to the terminals, the switching means having associated with each pole, a plurality of positions, including a first position, corresponding to said first condition, and a second position, corresponding to said second condition;

means for applying a low voltage, which is less than the voltage of electrical power source, to the load when said connection means is in the second condition;

monitoring means for monitoring a load impedance and for preventing the connection means from being transferred to or existing in said first condition when said impedance is indicative of the presence of a human being;

activation means responsive to the monitoring means, for controlling said means; and

said monitoring means including sensing means for directly sensing the current drawn by the load when said low voltage is applied thereto, and means for indicating the presence of a human being when the current sensed by the sensing means lies below a predetermined threshold value.

5,151,842

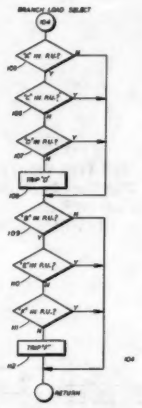
SWITCHBOARDS AND PANELBOARDS HAVING INTERLOCK AND LOAD SELECTION CAPABILITIES

Mark S. DeBiasi, Windsor, and Richard A. Menelly, Burlington, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 19, 1991, Ser. No. 687,649

Int. Cl.[5] H02H *3/00;* **H02B** *1/04*

U.S. Cl. 361—93 **5 Claims**



4. A circuit breaker interconnect arrangement comprising in combination:

a main circuit breaker having a main electronic trip unit including a microprocessor said main circuit breaker arranged for interrupting current through a protected main circuit;

a main terminal board connecting with said microprocessor and with a plurality of main terminals arranged on said main terminal board;

a first branch circuit breaker having an associated first electronic trip unit and a first actuator unit, said first trip unit having means outputting a first pick-up signal upon occurrence of an overcurrent condition through an associated first branch circuit, electrically in series with said main circuit said first actuator unit having means for interrupting current through said first branch circuit;

a first branch terminal board connecting with said first electronic trip unit, said first actuator unit and said main terminal board;

a second branch circuit breaker having an associated second electronic trip unit and a second actuator unit, said second branch circuit breaker being electrically in series with said main circuit breaker and said first branch circuit breaker, said second trip unit having means outputting a second pick-up signal upon the occurrences of an overcurrent condition through an associated second branch circuit, said second actuator unit having means for interrupting current through said second branch circuit;

a second branch terminal board connecting with said second electronic trip unit, said second actuator unit and said main terminal board;

a third branch circuit breaker having an associated third electronic trip unit and a third actuator unit, said third branch circuit breaker being electrically in parallel with said second branch circuit breaker, said third branch circuit breaker having means outputting a third pick-up signal upon occurrence of an overcurrent condition through a third branch circuit, said third actuator unit having means for interrupting current through said third branch circuit; and

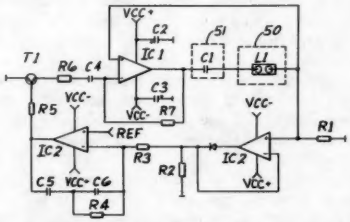
a third branch terminal board connecting with said third electronic trip unit, said third actuator unit and said main terminal board whereby said microprocessor inputs a trip signal to said second actuator unit to interrupt said second associated branch circuit upon receipt of said first pick-up signal.

5,151,843

SENSITIZER FOR FERROMAGNETIC MARKERS USED WITH ELECTROMAGNETIC ARTICLE SURVEILLANCE SYSTEMS

Jurgen Sanetra, and Heinrich Schug, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 8, 1989, Ser. No. 447,666
Int. Cl.[5] H01F *13/00*
U.S. Cl. 361—149 **5 Claims**



1. A resensitizer apparatus adapted for use with an electronic article serveillance system for detecting a resensitizable marker secured to a moving article, in which the marker includes a first, low-coercive force, high-permeability ferromagnetic material and at least one section of a remanently magnetizable, relatively higher coercive force material which when magnetized magnetically biases the low coercive force material and thereby alters the detectability of the marker; the resensitizer apparatus comprising:

(a) an assembly comprising at least one section of a second ferromagnetic material having two substantially opposed major surfaces, the surfaces facing but not touching each other such that a gap exists between the surfaces;

(b) a conductor wound around outer and inner portions of the second ferromagnetic material; and

(c) an alternating current source capable of driving the assembly at a constant maximum amplitude such that the assembly concentrates external magnetic lines of flux near the gap to produce a sufficient number of field reversals in a spatially decreasing magnetic field outside the gap to resensitize the marker while the marker is moving away from the gap, the current source comprising:

(1) a coil in series with a capacitor and a current sense resistor;

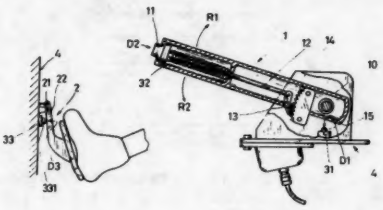
(2) means for determining a voltage drop across the sense resistor and using the voltage drop as feedback into a proportional-integral control circuit which compares the voltage drop to a precision voltage reference and hold the amplitude of the alternating current in the coil at a constant level.

5,151,844

HANDBRAKE OPERATED CONTROL MEANS FOR CONTROLLING VEHICLE ACCELERATOR PEDAL

Yu Lin, P. O. Box 55-1670, Taipei, Taiwan

Filed Aug. 7, 1990, Ser. No. 564,425
Int. Cl.[5] B60D *1/62*
U.S. Cl. 361—179 **1 Claim**



1. A hand brake operated control means of a vehicle comprising:

an electrical control circuit including a normal-open switch positioned under a rear cam portion of a hand brake lever to be operatively depressed by said rear cam portion of said hand brake lever when upwardly pulling said hand brake lever for braking a vehicle;

a normal-close switch formed in a front portion of said hand brake lever to be operatively depressed by a push button of said hand brake lever; and

an electromagnetic switch positioned behind or under a pivotal end portion of an accelerator pedal pivotally mounted in the vehicle, and having a core latch surrounded by an electromagnetic coil electrically connected to two poles of a power source of said electrical control circuit and a restoring spring normally pulling said core latch inwardly, allowing a normal depression on said accelerator pedal, whereby upon an upwardly pulling of said hand brake lever for braking the vehicle, said normal-open switch will be closed by the rear cam portion of the hand brake lever to close said control circuit to actuate said electromagnetic switch to protrude said core latch outwardly for retarding a depression of said accelerator pedal for preventing the driving of a hand braked vehicle for protecting the vehicle and preventing driving accident; and upon a depression of the push button of said hand brake lever, said normal-close switch will be opened as being depressed by said push button to thereby open said control circuit so as to retract said core latch of said electromagnetic switch for a free depression of said accelerator pedal for normally driving said vehicle.

5,151,845

ELECTROSTATIC CHUCK

Toshiya Watanabe, and Tetsuo Kitabayashi, both of Kanagawa, Japan, assignors to Toto Ltd., Fukuoka, Japan

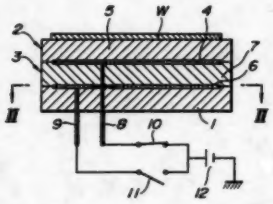
Continuation of Ser. No. 408,699, Sep. 18, 1989, abandoned. This application Oct. 11, 1991, Ser. No. 774,641
Claims priority, application Japan, Sep. 19, 1988, 63-234505
Int. Cl.[5] H02N *13/00*
U.S. Cl. 361—234 **12 Claims**

1. An electrostatic chuck for electrostatically attracting and holding an object, comprising:

a base plate;

at least two attractive layers located on said base plate, each attractive layer including an electrically insulating film of a temperature-dependent electrically insulating material with an upper surface and a lower surface and at least one electrode pattern attached to the lower surface, said at least two attractive layers being stacked one on another so that an uppermost one of said at least two stacked attractive layers provides support for an object to be electrostatically attracted; and

voltage applying means for selectively and individually applying a voltage to the respective electrode patterns so that the voltage can be applied to any one of said electrode patterns depending on a temperature at which the electrostatic chuck is used, thereby to provide a stable electrostatic force to electrostatically attract the object located on the insulating film of the uppermost one of said stacked attractive layers.



5,151,846

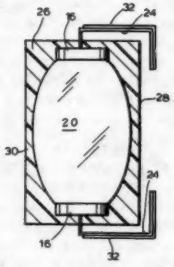
SURFACE MOUNTABLE RECTIFIER AND METHOD FOR FABRICATING SAME

Mohammad Sedigh, Merrick; Richard Shyr; Edward Shih, both of Greenlawn, and Muni Mitchell, Holbrook, all of N.Y., assignors to General Instrument Corp., Hatboro, Pa.

Filed Aug. 23, 1991, Ser. No. 748,876

Int. Cl.[5] H01G *9/16, 1/14;* H01L *23/02*

U.S. Cl. 361—306 **13 Claims**



1. A rectifier suitable for surface mounting comprising semiconductor diode, electrodes and leads bonded together, said leads having enlarged head portions with elongated lead portions, said elongated lead portions extending substantially axially in substantially opposite directions a glass capsule substantially surrounding said diode and electrodes with said enlarged head portions substantially exposed, the exposed elongated lead portions having flattened sections, a heat conductive, electrically insulating epoxy body surrounding said capsule, said enlarged head portions and at least a portion of each of said flattened sections, said flattened sections having a bend therein and a solderable coating on a said flattened sections proximate said bend.

5,151,847

DEVICE FOR ELECTRICALLY CONTACTING AN ELECTRONIC APPARATUS WITH AN IC-MEMORY CARD

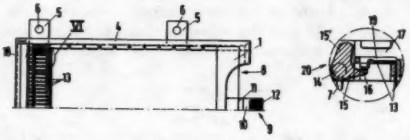
Paul-Georg Rautenberg, Wuppertal, Fed. Rep. of Germany, assignor to Stocko Metallwarenfabriken Henkels und Sohn GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Mar. 29, 1991, Ser. No. 677,587

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1990, 4010398

Int. Cl.[5] H05K *1/14*

U.S. Cl. 361—395 **8 Claims**



1. A device for electrically contacting respective contacts of an electronic apparatus with an electronic card that has contacting poles along one side thereof, with a housing being arranged t said electronic apparatus, into which housing said electronic card with said side having said contacting poles and facing said housing is inserted via an insertion opening, with said housing being provided with contact elements, that correspond to said contacting poles of said electronic card and with which said contacting poles of said electronic card, after insertion of said card into said housing are in contact, and being provided with a spring-type ejecting means for ejecting said electronic card that is arrested in said housing, the improvement wherein:

said electronic card is inserted directly between a bottom and a cover of said housing, with said side of said electronic card having said contacting poles directly contacting said contacting elements and loading said ejecting means;

a releasable arresting device in the form of a catch that is formed as an integral part of said housing is disposed at said insertion opening of said housing for arresting a rear end of said electronic card that is inserted into said housing and is contacting said contact elements; and

said contact elements are in the form of contacting springs that have coordinated therewith a lever having two legs and being pivotably supported at said housing, with a first one of said two legs engaging said contacting springs and with a second one of said legs being contacted by said side of said electronic card having said contacting poles, when said electronic card is in an inserted position in said housing, thereby pivoting said lever against a force of said contacting springs.

5,151,848

SUPERCAPACITOR

Duane Finello, Shalimar, Fla., assignor to The United States of America as represented by The Secretary of The Air Force, Washington, D.C.

Filed Aug. 24, 1990, Ser. No. 573,935

In:. Cl.[5] H01G *9/00*

U.S. Cl. 361—502 **8 Claims**

1. A supercapacitor, said supercapacitor comprising:

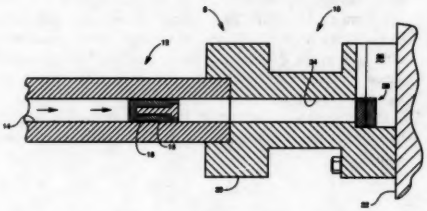
a first plate, said first plate having a porous surface;

a second plate, said second plate having a porous surface;

a solid polymer electrolyte, said solid polymer electrolyte impregnated into the porous surface of said first and said second plate;

means for electrically connecting to said plates; and

means for housing said plates with said solid polymer electrolyte therein and said means for electrically connecting,



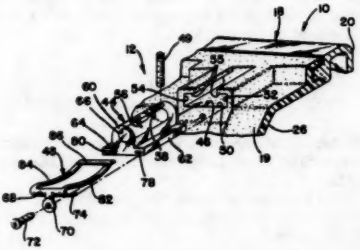
said supercapacitor having an energy density ranging from 0.1 to 2.0 joules per cubic centimeter.

5,151,849

HEADLAMP LEVELING ARRANGEMENT

William E. Nagengast, Anderson, and Philip C. Filosa, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 6, 1991, Ser. No. 740,743
Int. Cl.[5] F21M *3/18*
U.S. Cl. 362—61 3 Claims



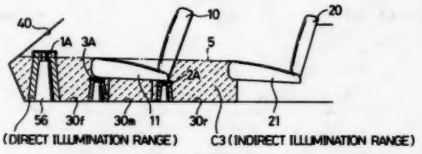
1. A leveling arrangement for a vehicle headlamp having a reflector member provided with a reflector cavity for projecting a light beam substantially parallel to an optical axis of the reflector cavity, a retainer slot formed in an upper portion of the reflector member, said slot being defined by a bottom wall, a top wall and a pair of side walls, a spirit level member provided with a pair of outwardly extending legs located in said retainer slot, a spring clip having an end thereof fastened to said reflector member and to a first end of said spirit level member and having a portion thereof located in said slot between said top wall and said legs for continuously biasing a second end of the spirit level member towards the bottom wall, and screw means threadably received by the spirit level member at the second end thereof and adapted to engage the bottom wall whereby rotation of said screw means causes pivoted adjustment of a position of the spirit level member about said first end and thereby allows the spirit level member to be calibrated relative to the optical axis of the reflector cavity.

5,151,850

VEHICLE ROOM FLOOR ILLUMINATING APPARATUS

Yoshio Matsuno; Shinichiro Choji, both of Tokyo; Kazuhiko Ito, Hirakata, and Teruaki Shigeta, Neyagawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Matsushita Electric Industrial Co., Ltd., Osaka, both of, Japan

Continuation of Ser. No. 538,332, Jun. 15, 1990. This application Dec. 6, 1991, Ser. No. 801,776
Claims priority, application Japan, Jun. 26, 1989, 1-164451
Int. Cl.[5] B60Q *3/00*
U.S. Cl. 362—75 3 Claims



1. A vehicle room floor illuminating apparatus for an automotive vehicle provided with at least one front seat arranged in a vehicle room, comprising:

(a) power supplying means; and

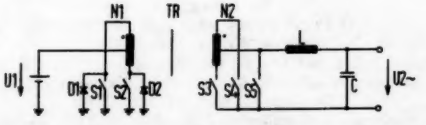
(b) at least one first foot lamp means connected to said power supplying means, for illuminating only a lower room space roughly below a seat cushion of the front seat in the vehicle room, said first foot lamp means being mounted in a first foot lamp range A defined between uppermost and lowermost positions of the front seat cushion in height and between a lower surface of an instrument panel and a frontmost end of the front seat cushion in longitudinal length, when seen from side of a vehicle.

5,151,851

METHOD AND CIRCUIT ARRANGEMENT FOR GENERATING A SINUSOIDAL LINE AC VOLTAGE FROM A DC VOLTAGE

Peter Busch, Augsburg; Helmut Rettenmaier, Grossaitingen, and Willi Sterzik, Augsburg, all of Fed. Rep. of Germany, assignors to Siemens Nixdorf Informationssystem AG, Munich, Fed. Rep. of Germany

Filed Jun. 20, 1991, Ser. No. 717,939
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1990, 4019665
Int. Cl.[5] H02M *7/538*
U.S. Cl. 363—25 10 Claims



1. A method for generating a sinusoidal line AC voltage from a DC voltage that, for transmission via a high-frequency transformer, is converted into alternatingly successive upward and downward square-wave voltage pulses having a respectively maximum pulse-duty factor of 50 percent and a constant pulse frequency, being tapped with a respectively given, fixed pulse-duty factor after the transmission and being then filtered, comprising the steps of:

varying the pulse-duty factor of the upward or, respectively, downward voltage pulses in the range between 0 and 50 percent in accordance with the sinusoidal change of the sinusoidal line AC voltage;

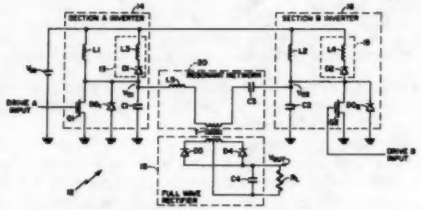
shorting the secondary side of the high-frequency transformer during voltage pulse pauses between the alternatingly successive upward or, respectively, downward volt-

age pulses, said voltage pulse pauses being caused by the variation of the pulse-duty factor given simultaneous constant pulse frequency.

5,151,852
CLASS E POWER AMPLIFIER

Boris S. Jacobson, Plaistow, N.H., and Raymond A. DiPerna, Sherborn, Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 666,770, Mar. 8, 1991, Pat. No. 5,065,300. This application Jul. 12, 1991, Ser. No. 729,254
Int. Cl.[5] H02M *7/537*
U.S. Cl. 363—131 **6 Claims**



1. A Class E power amplifier comprising:

a DC power source (V_{IN}) having a common port and a voltage port;

a parallel loaded network, having a first port, a second port and a third port, said first port being connected to said voltage port of said DC power source (V_{IN}) and said third port being connected to said common port of said DC power source (V_{IN});

switching means for turning ON and OFF in accordance with a control signal, said switching means having a first terminal connected to said common port of said DC power source and a second terminal connected to said second port of said parallel loaded network;

a load means coupled to said second port of said parallel loaded network; and

said parallel loaded network comprises a series circuit means in parallel with an inductor means connected between said first port and said second port and a capacitor means connected between said second port and said common port of said DC power source (V_{IN}), said series circuit means providing a fast discharge path for capacitance at said second port.

5,151,853
CYCLOCONVERTER AND THE METHOD OF CONTROLLING THE SAME

Shinji Tatara, and Masami Okayasu, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 13, 1991, Ser. No. 668,785
Claims priority, application Japan, Mar. 13, 1990, 2-61529
Int. Cl.[5] H02M *5/443*
U.S. Cl. 363—160 **11 Claims**

1. A cycloconverter comprising:

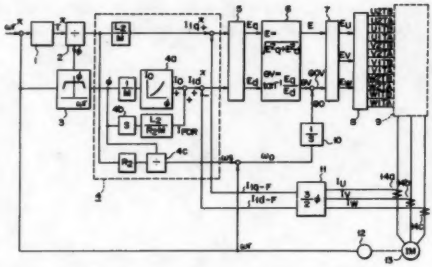
a converter group, having at least two cascade-connected converters for controlling a firing angle of each of said converter to convert an AC power given to each of said converters into an AC power having an arbitrary frequency;

reference voltage generating means for generating a reference voltage signal having a frequency corresponding to the frequency of the AC power to be output from said converter group;

first output voltage generating means for generating a first voltage signal obtained by adding a DC voltage to an AC signal having an amplitude corresponding to a difference between a maximum output voltage of said converter and the DC voltage, and a second voltage signal obtained by subtracting the first voltage signal from the reference voltage signal;

second output voltage generating means for generating a third voltage signal obtained by subtracting the DC voltage from an AC signal having an amplitude corresponding to a difference between the DC voltage and the maximum output voltage of said converter, and a fourth voltage signal obtained by subtracting the third voltage signal from the reference voltage signal;

DC component varying means for varying the DC voltage in accordance with the frequency of the reference voltage signal;



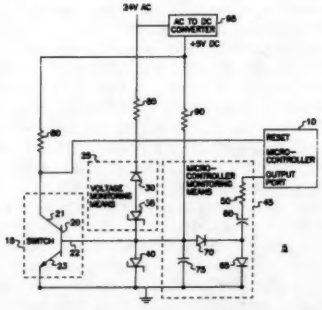
first firing angle control means for supplying, while the reference voltage signal is positive, a firing signal corresponding to a voltage value of the first voltage signal to one of said converters and a firing signal corresponding to a voltage value of the second voltage signal to the other of said converters; and

second firing angle control means for supplying, while the reference voltage signal is negative, a firing signal corresponding to a voltage value of the third voltage signal to said the other said converters and a firing signal corresponding to a voltage value of the fourth voltage signal to said one of said converters.

5,151,854
INTEGRATED LOW VOLTAGE DETECT AND WATCHDOG CIRCUIT

John T. Adams, Minneapolis, and Timothy M. Tinsley, Coon Rapids, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 20, 1990, Ser. No. 556,923
Int. Cl.[5] G05B *23/02*; G06F *11/30*
U.S. Cl. 364—184 **14 Claims**



1. A monitoring circuit for a microcontroller, the microcon-

troller including an output port and a reset port, the microcontroller being adapted to reset when a first signal is present at the reset port, the monitoring circuit comprising:

a switch having a control line, said switch being adapted to provide a continuous second signal different from the first signal, to the reset port when a low voltage is present at said control line, and the first signal otherwise;

a voltage monitoring means having an output port electrically connected to said control line, said voltage monitoring means being adapted to measure a desired voltage and producing a low voltage at said output port of said voltage monitoring means when said desired voltage is within a predetermined range of values, and a high voltage otherwise; and

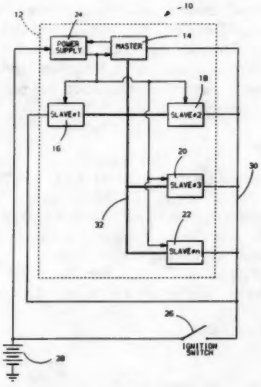
microcontroller monitoring means having an input port connected to the output port of the microcontroller and an output port connected to said control line, said microcontroller monitoring means being adapted to produce a low voltage at said output port of said microcontroller monitoring means when the microcontroller produces an output signal within a predetermined frequency range, and a high voltage otherwise.

5,151,855

MULTIPLE MICROPROCESSOR SINGLE POWER SUPPLY SYSTEM SHUTDOWN

Charles A. Gray, Rochester; Rimas S. Milunas, Royal Oak, and Larry T. Nitz, Troy, all of Mich., assignors to Saturn Corporation, Troy, Mich.

Filed Oct. 19, 1989, Ser. No. 423,918
Int. Cl.[5] G06F *1/30*
U.S. Cl. 395—750 **2 Claims**



1. A power shutdown method for a system having a master microprocessor, a slave microprocessor having an analog-to-digital converter, and a single supply voltage source for the master and slave microprocessors, the master and the slave microprocessors communicating via a communication link therebetween, the method comprising the steps of:

sensing a power shutdown condition by the master microprocessor;

sending a shutdown command from the master microprocessor through the communication link to the slave microprocessor to initiate slave shutdown procedures including storing variables to memory when a shutdown condition is sensed by the master microprocessor;

powering down the system including the voltage source by the master microprocessor after a predetermined minimum time period after sending a shutdown command to the slave microprocessor, the minimum time period having a predetermined value that allows the slave microprocessor to complete the slave shutdown procedures;

sensing a failed condition of the communication link by the slave microprocessor;

sensing the power shutdown condition by the slave microprocessor analog-to-digital converter;

sensing a failed condition of the slave microprocessor analog-to-digital converter by the slave microprocessor;

executing shutdown procedures by the slave microprocessor (A) in response to a shutdown command received from the master microprocessor of (B) when the failed condition of the communication link is sensed by the slave microprocessor and the power shutdown condition is sensed by the slave microprocessor; and

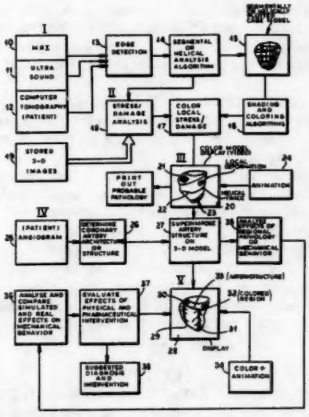
bypassing the shutdown procedures by the slave microprocessor when (A) the failed condition of the communication link is sensed by the slave microprocessor and (B) the failed condition of the analog-to-digital converter is sensed by the slave microprocessor.

5,151,856

METHOD OF DISPLAYING CORONARY FUNCTION

Menachem Halmann; Haim Azhari; Rafael Beyar; Samuel Sideman, and Uri Dinnar, all of Haifa, Israel, assignors to Technion R & D Found. Ltd., Haifa, Israel

Filed Aug. 30, 1989, Ser. No. 400,689
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—413.03 **17 Claims**



10. A method of displaying the function of a mammalian heart, comprising the steps of:

(a) generating a plurality of two-dimensional sections of a mammalian heart;

(b) subjecting said sections automatically to a segmental or helical pattern analysis to generate a three-dimensional model of said mammalian heart;

(c) analyzing said sections for ascertaining a presence of mechanical degradation of certain zones of the heart;

(d) electronically coloring zones of the displayed model corresponding to said certain regions;

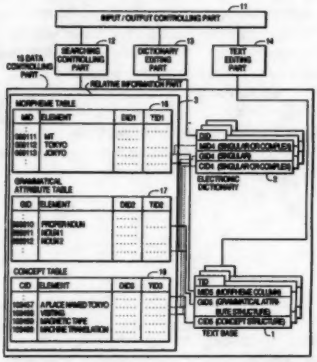
(e) displaying said model with said colored zones; and

(f) subjecting the model displayed in step (e) to video animation.

5,151,857
DICTIONARY LINKED TEXT BASE APPARATUS

Kunio Matsui, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 18, 1990, Ser. No. 629,741
Claims priority, application Japan, Dec. 18, 1989, 1-327671
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—419 **11 Claims**



1. A dictionary-linked text base apparatus for enabling a text search at a morpheme level in which, for a searched object word inputted in a form of a morpheme, all texts including the morpheme become searched objects, a text search at a syntactical level in which all texts related to a grammatical attribute of a registered item which is either the morpheme or a combination thereof in the dictionary-linked text base apparatus, become searched objects, a text search at a semantic level in which all texts related to at least one of the registered items become searched objects, said dictionary-linked text base apparatus having a function of searching a text in a text base comprising:

an electronic dictionary including information comprising:

a morpheme identifier the same as an item being searched or a combination comprising a plurality of morphemes forming said item;

a grammatical attribute identifier of said item; and

a concept identifier of said item, corresponding to an identifier for each registered item; and

a relative information part, operatively connected to said electronic dictionary, having an identifier for a related text in the text base and having an identifier for a related text in said electronic dictionary for each said morpheme identifier, said grammatical attribute identifier and said concept identifier appearing in said electronic dictionary.

5,151,858
MULTIPLE MODE ADAPTIVE PRESSURE CONTROL FOR AN AUTOMATIC TRANSMISSION

Rimas S. Milunas, Royal Oak, and Larry T. Nitz, Troy, both of Mich., assignors to Saturn Corporation, Troy, Mich.

Filed Oct. 5, 1990, Ser. No. 593,918
Int. Cl.[5] B60K *17/10, 41/06*
U.S. Cl. 364—424.1 **7 Claims**

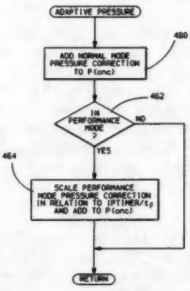
1. Control apparatus for a motor vehicle multiple speed ratio automatic shift transmission having a fluid operated clutch associated with a specified speed ratio, wherein shifting to said specified speed ratio includes a completion phase during which fluid is supplied to the clutch to initiate and progressively increase torque transmission therethrough, the control apparatus comprising:

driver operated switch means for selecting either a normal or performance shift mode;

base table means for storing a predetermined schedule of fluid pressure to be supplied to said clutch during said completion phase;

pressure correction means for developing an adaptive correction amount for said predetermined schedule in relation to a comparison between an expected duration of said completion phase and an actual duration of said completion phase;

means for applying the adaptive correction amount (1) to a normal mode correction table when said normal shift mode is selected, and (2) to a performance mode correction table when the performance shift mode is selected;


ADAPTIVE PRESSURE
ADD NORMAL MODE PRESSURE CORRECTION TO P(onc)
IN PERFORMANCE MODE ?
NO
YES
SCALE PERFORMANCE MODE PRESSURE CORRECTION IN RELATION TO (PTIME/Et) AND ADD TO P(onc)
RETURN

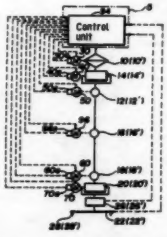
means for supplying the fluid to said clutch in accordance with a combination of said predetermined pressure schedule and a normal mode correction amount determined from said normal mode correction table when said normal shift mode is selected; and

means for supplying the fluid to said clutch in accordance with a combination of said predetermined pressure schedule, a normal mode correction amount determined from said normal mode correction table, and a performance mode correction amount determined from said performance mode correction table when said performance shift mode is selected.

5,151,859
LEGGED WALKING ROBOT AND SYSTEM FOR CONTROLLING THE SAME

Ryutaro Yoshino; Hiroshi Gomi; Masao Nishikawa, and Masato Hirose, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 545,282
Claims priority, application Japan, Jun. 29, 1989, 1-167295
Int. Cl.[5] B62D *57/02*
U.S. Cl. 364—424.02 **13 Claims**



12. A system for controlling a drive joint of a walking robot having legs comprising:

an angle detector for detecting a drive joint angle;

means for setting desired angular movement of the drive joint;

a controller for determining a control value of the drive joint

angle, linked to the means for setting and angle detector, to decrease any deviation of the detected drive joint angle and a desired angle of the drive joint, such that the robot moves with a desired gait;

a ground reaction detector on at least one of the legs and linked to the controller; and

a corrector associated with the controller to correct the control value in response to a detected ground reaction.

5,151,860

CONTROL METHOD FOR ELECTRIC POWER STEERING APPARATUS FOR VEHICLE

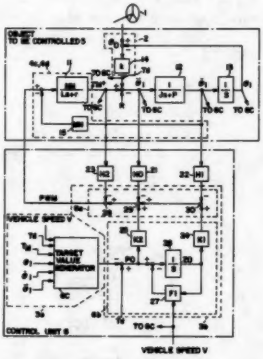
Yoshiaki Taniguchi; Masaki Watanabe, both of Saitama; Ryuji Iizawa, and Fumitoshi Mori, both of Kanagawa, all of Japan, assignors to Jidoshi Kiki Co., Ltd., Tokyo and Fujitsu, Ltd., Kanagawa, both of, Japan

Continuation of Ser. No. 290,697, Dec. 27, 1988, abandoned. This application Nov. 20, 1991, Ser. No. 798,026

Claims priority, application Japan, Dec. 29, 1987, 62-335531

Int. Cl.[5] B62D *5/04*

U.S. Cl. 364—424.05 **4 Claims**



1. A control system for an electric power steering apparatus for a vehicle, said control system comprising:

a torque sensor which is used to detect a steering torque resulting from a steering operation performed by a driver;

a target value setting means for setting a predetermined target value relating to a power steering control of said steering apparatus; and

a primary delay system setting means including:

a first comparator means for comparing said detected steering torque with said predetermined target value,

an arithmetic amplifier including an amplifier with a gain (F1), said gain being varied in accordance with the speed of the vehicle,

a second comparator means for comparing an output (P0) of said first comparator with an output of said amplifier,

an integrating means (26) for integrating an output of said second comparator means and generating said integrated output as an output of said arithmetic amplifier, and

a third comparator means (30,28) for comparing said output of said integrating means with signals relating to mechanical and electrical compensation delay of said steering torque to generate a control signal transmitted to a motor means of said control system for preventing oversteering of said vehicle.

5,151,861

VEHICLE ENGINE OUTPUT CONTROL METHOD AND VEHICLE ENGINE

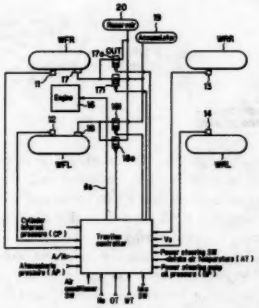
Yoshiaki Danno, Kyoto; Kazuhide Togai, Takatsuki; Masato Yoshida, Kyoto; Katsunori Ueda, Kyoto, and Makoto Shimada, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 482,169, Feb. 20, 1990, abandoned. This application Feb. 21, 1992, Ser. No. 840,646

Claims priority, application Japan, Feb. 22, 1989, 1-42421; Feb. 22, 1989, 1-42422

Int. Cl.[5] F02D *41/04*; G06F *15/50*

U.S. Cl. 364—426.02 **8 Claims**



1. A vehicle engine output control method comprising:

calculating a target torque of an engine in accordance with an operational condition of a vehicle;

calculating a target intake air amount per engine revolution cycle necessary to output said target engine torque;

calculating an opening of a sub throttle valve disposed in an intake path of the engine from an opening of a main throttle valve disposed in the intake path of which said opening of said main throttle valve is controlled in accordance with an operation amount of an accelerator pedal and said target intake air amount;

on/off controlling said sub throttle valve in accordance with said calculated sub throttle valve opening; and

correcting said target engine torque in accordance with a response delay of a torque converter signal, a transmission friction signal, an external load signal of the engine, an atmospheric condition signal, and said operational condition of the vehicle, and, calculating said target intake air amount in accordance with said corrected target engine torque.

5,151,862

VEHICULAR TRAVELING DIRECTION MEASURING SYSTEM

Okihiko Nakayama; Hiroshi Tsuda; Katsuhiko Mizushima; Toshiyuki Itoh, and Hiroshi Ueno, all of Kanagawa, Japan, assignors to Nissan Motor Company, Ltd., Japan

Continuation of Ser. No. 467,834, Jan. 11, 1990, abandoned. This application May 20, 1991, Ser. No. 704,719

Claims priority, application Japan, Jan. 13, 1989, 1-6620

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—454 **12 Claims**

1. A system for measuring a traveling direction of a vehicle, comprising:

first means for deriving a first variation representing a change in a traveling direction of the vehicle based on an output from a gyro sensor;

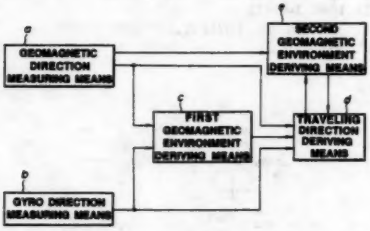
second means for deriving a first vehicle traveling direction based on said first variation;

third means for deriving a second vehicle traveling direction based on an output from a geomagnetic sensor, said geo-

magnetic sensor deriving said output based on a geomagnetic field around the vehicle;

fourth means for deriving a second variation representing a change in said second vehicle traveling direction;

fifth means for deriving a first index, said first index indicative of a difference between said first and second variations to represent a disturbance of the geomagnetic field on a short distance basis;


GEOMAGNETIC DIRECTION MEASURING MEANS
SECOND GEOMAGNETIC ENVIRONMENT DERIVING MEANS
FIRST GEOMAGNETIC ENVIRONMENT DERIVING MEANS
TRAVELING DIRECTION DERIVING MEANS
GYRO DIRECTION MEASURING MEANS

sixth means for deriving a second index, said second index indicative of a difference between said first and second vehicle traveling directions to represent a disturbance of the geomagnetic field on a long distance basis; and

seventh means for calculating a third vehicle traveling direction based on said first and second directions, said seventh means changing a rate of dependence upon said first and second directions based on values of said first and second indicies to derive said third vehicle traveling direction.

5,151,863

EMBROIDERY PATTERN DATA PROCESSOR HAVING A SEWING ORDER DESIGNATION MECHANISM

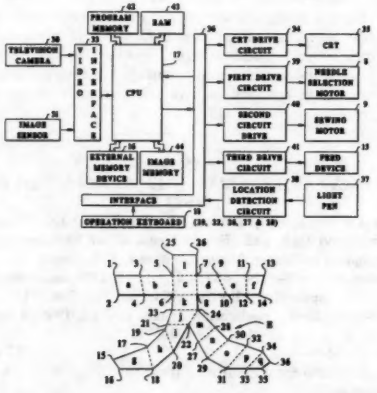
Kyozi Komuro; Atsuya Hayakawa, and Hideaki Shimizu, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 16, 1990, Ser. No. 552,995

Claims priority, application Japan, Jul. 19, 1989, 1-188054

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—470 **19 Claims**



1. An embroidery pattern data processor for a sewing machine that sews, under control of needle location data, an embroidery pattern comprising at least one closed area, comprising:

section data memory means for storing section data representing sections into which outlines representing the at least one closed area are divided;

designation means for designating a starting section and an ending section for each of the at least one closed areas; and

needle location computing means for computing needle location data so that the sewing machine embroiders the ending section of each closed area after embroidering all other sections of the closed area by determining, when the needle location computing means computes data for a given ending section, whether any other sections of the closed area containing the given ending section exist for which the needle location data computing means has not computed needle location data.

5,151,864

METHOD OF GENERATING CUTTING PASSES OF COMPLEX CURVED SURFACE

Masaki Seki, Tokyo; Koji Samukawa, and Osamu Hanaoka, both of Yamanashi, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

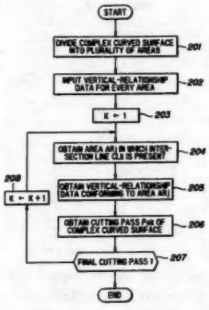
PCT No. PCT/JP89/00508, § 371 Date Jan. 31, 1990, § 102(e) Date Jan. 31, 1990, PCT Pub. No. WO89/12265, PCT Pub. Date Dec. 14, 1989

PCT Filed May 22, 1989, Ser. No. 460,069

Claims priority, application Japan, May 31, 1988, 63-133245

Int. Cl.[5] G05B *19/18*

U.S. Cl. 364—474.23 **10 Claims**



1. A method of generating cutting passes of a complex curved surface comprising the steps of:

(a) specifying a plurality of input curved surfaces constituting the complex curved surface, a vertical relationship among these input curved surfaces and a cutting pass on a reference plane;

(b) adopting, from among projected points obtained when a point on the cutting pass is projected onto each of the input curved surfaces, one of the projected points determined by said vertical relationship as a point on a cutting pass for cutting the complex curved surface;

(c) dividing the complex curved surface into areas and specifying vertical relationships of only the input curved surfaces in each of the areas;

(d) obtaining cutting passes of the complex curved surface in each of the areas by using the vertical relationships of said areas; and

(e) obtaining cutting passes of the complex curved surface by combining the cutting passes of all of the areas; and

(f) machining a workpiece based on the cutting passes obtained.

5,151,865

METHOD AND APPARATUS FOR DETERMINING THE ENERGY CONTENT VALUE OF ELECTROCHEMICAL ENERGY STORES

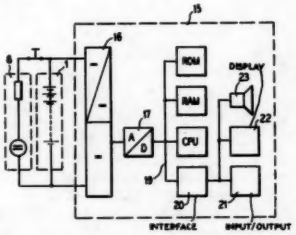
Andreas Blessing, Tennenbronn; Jochen Griss, St. Georgen, and Gerd Kammerer, Lossburg, all of Fed. Rep. of Germany, assignors to Grasslin KG, Fed. Rep. of Germany

Continuation of Ser. No. 377,829, Oct. 22, 1988, abandoned. This application May 1, 1991, Ser. No. 693,046

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1987, 3736481; Oct. 28, 1988, PCT/DE88/00647

Int. Cl.[5] G06F *15/20*; H02J *7/00*

U.S. Cl. 364—483 7 Claims



1. Method for determining an energy content value of an electrochemical energy store under operating conditions, comprising the steps of:

connecting the electrochemical energy store to one of a source and load;

connecting a measuring instrument to the electrochemical energy store;

sampling a terminal voltage of the electrochemical energy store in a measurement time with the measuring instrument;

providing a relative remaining capacity of the electrochemical energy store;

automatically retrieving at least three individual reference values from stored relationship of terminal voltages to sum currents for the provided relative remaining capacity;

automatically interpolating an assumed sum current from the sum currents that correspond to the at least three individual reference values;

calculating an absolute capacity by multiplying the assumed sum current by the measurement time;

using stored characteristics of the energy store to derive a maximum capacity corresponding to the assumed sum current for a maximum obtainable discharge time; and

calculating a new remaining capacity by subtracting from the initial remaining capacity a ratio of the absolute capacity to the maximum capacity, the new reaming capacity being the energy content value of the energy store;

displaying the new remaining capacity on the measuring instrument; and

disconnecting the electochemical energy store from the source or load when the energy content value reachers a predetermined value.

5,151,866

HIGH SPEED POWER ANALYZER

R. Steven Glaser, and Jeffrey M. Bade, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 502,050, Mar. 30, 1990, abandoned. This application Dec. 13, 1991, Ser. No. 809,021

Int. Cl.[5] G06F *15/20*

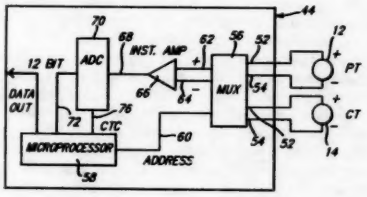
U.S. Cl. 364—483 21 Claims

1. A high speed power analyzer for measuring electrical parameters in an alternating waveform power system having a plurality of distribution circuits, comprising:

input means for receiving a plurality of analog input signals which represent electrical parameters of the distribution circuits being monitored, where at least one of said analog input signals represents a voltage signal and another of said analog input signals represents a current signal;

multiplexer means connected to said input means for sampling each of said analog input signals by individually transmitting selected ones of said analog input signals;

converter means, connected to said multiplexer means, for converting sampled analog input signals received from said multiplexer means into a digital representation of said analog input signals; and



processor circuit means, coupled to said multiplexer means and said converter means, for controlling the sampling of said analog input signals by said multiplexer means in accordance with a predetermined sampling schedule which is nonsynchronous with the waveform of said power system, and for processing said digital representations of said analog input signals received from said converter means to produce a plurality of output signals which are indicative of predetermined electrical variables related to the power being used in said distribution circuits.

5,151,867

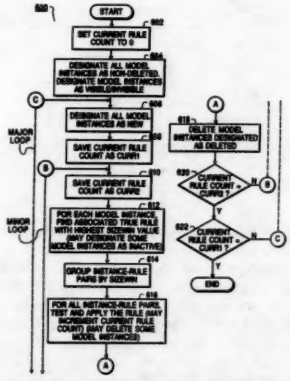
METHOD OF MINIMIZING SUM-OF-PRODUCT CASES IN A HETEROGENEOUS DATA BASE ENVIRONMENT FOR CIRCUIT SYNTHESIS

Donald F. Hooper, Northborough; James L. Finnerty, Lexington; David B. Fite, Northborough, and Snehamay Kundu, Marlboro, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 907,303, Sep. 12, 1986, abandoned. This application Jun. 28, 1989, Ser. No. 373,086

Int. Cl.[5] G06F *15/60, 15/40*

U.S. Cl. 364—489 38 Claims


START
SET CURRENT RULE COUNT TO 0
DESIGNATE ALL MODEL INSTANCES AS NON-DELETED; DESIGNATE MODEL INSTANCES AS VISIBLE/INVISIBLE
DESIGNATE ALL MODEL INSTANCES AS NEW
SAVE CURRENT RULE COUNT AS CURR1
SAVE CURRENT RULE COUNT AS CURR2
FOR EACH MODEL INSTANCE, FIND ASSOCIATED TRUE RULE WITH HIGHEST SCENIN VALUE (MAY DESIGNATE SOME MODEL INSTANCES AS INACTIVE)
GROUP INSTANCE-RULE PAIRS BY SCENIN
FOR ALL INSTANCE-RULE PAIRS, TEST AND APPLY THE RULE (MAY INCREMENT CURRENT RULE COUNT) (MAY DELETE SOME MODEL INSTANCES)
DELETE MODEL INSTANCES DESIGNATED AS DELETED
CURRENT RULE COUNT = CURR1 ?
CURRENT RULE COUNT = CURR2 ?
END
MAJOR LOOP
MINOR LOOP
A
B
C

1. A process of synthesizing a circuit design stored in a data processing system including a data base, by replacing a set of

current model instances each model instance consisting of a representation of a portion of an electrical circuit currently representing the circuit design in the data base with a new set of model instances and by altering attribute values stored in the data base and associated with objects in the data base by application of selected ones of a set of rules stored in the data base to associated ones of the current model instances, each of the rules including an antecedent portion that evaluates to one of TRUE and FALSE and including a consequence portion indicating an action, the antecedent portion comprising at least one test, the process comprising the steps, performed by the data processing system, of:

initializing a benefit variable stored in the data base to a predetermined threshold value representing a benefit that must be achieved by application of a rule;

testing an antecedent portion of a rule in the set of rules, the antecedent portion including a plurality of subportions including a benefit variable subportion, by performing the following substeps contained in the benefit variable subportion of the antecedent portion of the rule:

determining a benefit value representing a benefit that is achieved by application of the rule, and

determining the benefit variable subportion to be TRUE when the determined benefit value is greater than the benefit variable stored in the data base;

determining the antecedent portion to be TRUE when all subportions of the antecedent portion are TRUE; and

applying the rule by performing the action indicated by the consequence portion of the rule on items in the data base when the antecedent portion is TRUE.

5,151,868

SIGNAL LINE TERMINAL ALLOCATION METHOD

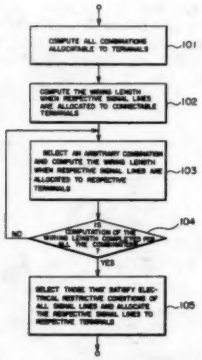
Yoshinori Nishiyama, Odawara; Tomoatsu Yanagita, Ebina; Masahiko Nagai, Kanagawa; Mitsuru Morikuni, Ebina, and Kenji Matsumoto, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Computer Engineering Co., Ltd., Kanagawa, both of, Japan

Filed Jan. 31, 1990, Ser. No. 472,816

Claims priority, application Japan, Feb. 6, 1989, 1-025785

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—490 **7 Claims**


COMPUTE ALL COMBINATIONS ALLOCATABLE TO TERMINALS
101
COMPUTE THE WIRING LENGTH WHEN RESPECTIVE SIGNAL LINES ARE ALLOCATED TO CONNECTABLE TERMINALS
102
SELECT AN ARBITRARY COMBINATION AND COMPUTE THE WIRING LENGTH WHEN RESPECTIVE SIGNAL LINES ARE ALLOCATED TO RESPECTIVE TERMINALS
103
IS COMPUTATION OF THE WIRING LENGTH COMPLETED FOR ALL THE COMBINATIONS ?
104
NO
YES
SELECT THOSE THAT SATISFY ELECTRICAL RESTRICTIVE CONDITIONS OF ALL SIGNAL LINES AND ALLOCATE THE RESPECTIVE SIGNAL LINES TO RESPECTIVE TERMINALS
105

1. A signal line terminal allocation method executed by a computer for an electronic device which is hierarchically designed, said electronic device comprising high hierarchial components and low hierarchial components, the high hierarchial components being connected to the low hierarchial components by a plurality of signal lines through a plurality of signal line terminals, the method comprising the steps of:

obtaining all of the different plural combinations of an allocation of the plurality of signal lines to the plurality of signal line terminals;

calculating a plurality of the signal line lengths for all of the different plural combinations, each of the plurality of the signal line lengths corresponding to a sum of line lengths of each of the plurality of signal lines in the allocation;

selecting plural combinations of the allocation of the plurality of signal lines in which electrical restrictions corresponding to said each of the plurality of signal liens are satisfied, the electrical restrictions comprising an allowable maximum line length of said each of the plurality of signal lines; and

allocating said each of the plurality of signal lines to the plurality of signal line terminals in accordance with one combination from the plural combinations which satisfies said electrical restrictions.

5,151,869

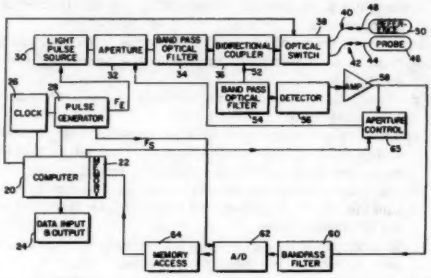
FREQUENCY DOMAIN FLUOROMETRY USING COHERENT SAMPLING

J. Ricardo Alcala, Chatham, N.J., assignor to The BOC Group, Inc., New Providence, N.J.

Filed Feb. 16, 1990, Ser. No. 481,406

Int. Cl.[5] G06G *7/58*; G01N *21/64*

U.S. Cl. 364—497 **36 Claims**



1. Apparatus for determining a response of a chemical composition to light comprising:

(a) excitation means for producing excitation light having repetitive variations in amplitude, including a fundamental component varying at a fundamental frequency F_e and fundamental repetition period T_3 and also including harmonic components varying at harmonic frequencies which are integral multiplies of F_e and applying said excitation light to said composition whereby said composition will emit light having repetitive variations in amplitude at modulation frequencies corresponding to F_e and to said harmonic frequencies;

(b) sampling means for directly sampling the amplitude of light emitted by said composition repetitively at a sampling frequency F_s and sampling period T_s such that F_s is less than F_e and T_s is greater than T_e, and T_s is not an integral multiple of T_e and providing a response series of sample values representing said amplitude of said emitted light, whereby said response series of samples will represent a sampled response signal corresponding to the variations in amplitude of said emitted light at said modulation frequencies and;

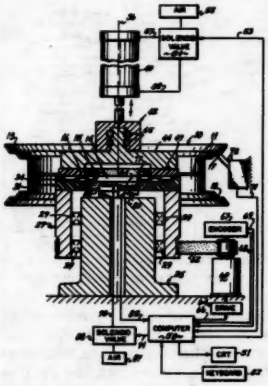
(c) means for determining at least one characteristic of said sampled response signal.

5,151,870

APPARATUS AND METHOD FOR DETERMINING A CENTER AND MEASURING WITH REFERENCE THERETO

James C. Beebe, Kent; Barry D. Cargould, Hudson, and David W. Lees, Sr., North Canton, all of Ohio, assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 17, 1989, Ser. No. 439,231
Int. Cl.[5] G01B 21/00
U.S. Cl. 364—556 44 Claims



23. An apparatus for determining the center of a surface feature of an object, said apparatus comprising:

(a) positioning means for maintaining the position of the object fixed in relation to a measuring axis;

(b) probe means for generating a signal correlated to the distance between a point on said measuring axis and each of a series of points on the surface feature, said probe means and the surface feature being movable with respect to one another, and

(c) computer means coupled to said probe means for:

(i) processing said signal to repetitively:

(1) identify ones of said points incapable of lying on a maximum inscribed circle of said surface feature and

(2) effectively discard said ones of said points until only a predetermined number of said points remain in said series of points, said predetermined number of points specifying said maximum inscribed circle, and

(ii) calculating the center of said maximum inscribed circle, said center corresponding to the center of said surface feature of the object.

5,151,871

METHOD FOR HEAT-PROCESSING SEMICONDUCTOR DEVICE AND APPARATUS FOR THE SAME

Kimiharu Matsumura, Kumamoto; Hiroyuki Sakai, Nishigoshi; Masaaki Murakami, Kumamoto; Tetsuya Oda, Tamana, and Chizo Yamaguchi, Sencho, all of Japan, assignors to Tokyo Electron Limited, Tokyo and Tokyo Electron Kyushu Limited, Kumamoto, both of, Japan

Filed Jun. 15, 1990, Ser. No. 538,710
Claims priority, application Japan, Jun. 16, 1989, 1-154119; Oct. 24, 1989, 1-276564
Int. Cl.[5] H05B 3/68
U.S. Cl. 364—557 12 Claims

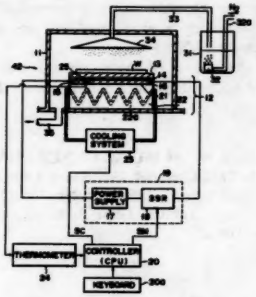
7. An apparatus for heat-processing an object, comprising:

a stage including heating means and cooling means, said heating means comprising a conductive thin film for heating the object;

detecting means for detecting temperatures of the object on the stage;

storing means for storing recipe information, said recipe information comprising temperature-time points in a heating step for heating said object from ambient temperature to a process temperature, a cooling step for cooling the object from said process temperature to ambient temperature, and a processing step during which the process temperature is maintained; and

process control means for controlling the heating and cooling means in accordance with the time-temperature recipe information and temperature of the object.

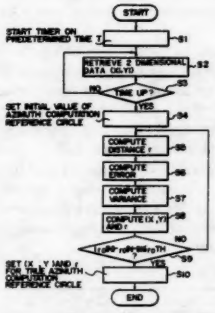


5,151,872

METHOD AND APPARATUS FOR CORRECTING THE OUTPUT OF AN ONBOARD VEHICLE TERRESTRIAL MAGNETISM SENSOR

Kiyomi Suzuki, and Masaru Chijiiwa, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 24, 1990, Ser. No. 556,545
Claims priority, application Japan, Oct. 17, 1989, 1-269386
Int. Cl.[5] G01C 17/38
U.S. Cl. 364—571.05 2 Claims



1. A method for correcting the output of a terrestrial magnetism sensor mounted on a vehicle comprising the steps of:

generating an output from the terrestrial magnetism sensor;

detecting an error in the output of the terrestrial magnetism sensor caused by extraneous magnetic influence;

selecting a plurality of data pairs x_o, y_o form the output of the terrestrial magnetism sensor;

determining from said plurality of data pairs x_o, y_o an initial radius r_o and initial center coordinates x_o, y_o of an initial azimuth computation reference circle;

computing a distance r_o between each of said plurality of data pairs x_o, y_o and said initial center coordinates x_o, hd o;

calculating a difference between each distance r_o and said initial radius r_o;

obtaining a variance σ^2 from squares of the calculated differences;

determining an updated radius r'_o and updated center coordinates x'_o, y'_o of the azimuth computation reference circle such that said variance σ^2 is minimized with respect to changes in coordinates x, y and radius r;

establishing an updated azimuth computation reference circle from said updated radius r'_o and said updated center coordinates x'_o, y'_o; and

correcting the output of the terrestrial magnetism sensor using said updated azimuth computation reference circle.

5,151,873

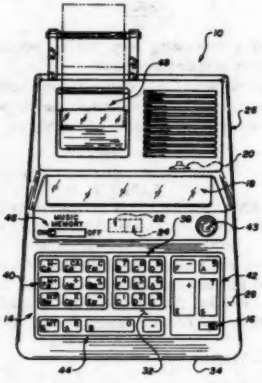
CALCULATOR WITH MUSIC GENERATING DEVICE

John R. Hirsh, 5162 Cheswick Dr., Solon, Ohio 44139

Filed Sep. 17, 1990, Ser. No. 583,859

Int. Cl.[5] G06F 3/00

U.S. Cl. 364—710.12 **22 Claims**



1. Apparatus comprising a housing having calculating means and music generating means therein and a keyboard attached thereto;

said housing and keyboard simulating the housing and keyboard layout of a desk-top electronic calculator, and said housing being adapted to rest on a surface;

said keyboard having a plurality of numerical keys and function keys attached to said calculating means for actuating said calculating means; and

each of said plurality of numerical and function keys being selectively actuatable to cause said music generating means to generate a respective musical note, said numerical and function keys corresponding to the following musical notes:

Key	Note	Key	Note
R	A	MS	B sharp
0	B	X	C sharp
1	C	=	E sharp
2	D	M+	F sharp
3	E		A sharp
4	F	%	B sharp
5	G	M−	C sharp
6	A	Clear All	E sharp
7	B	Clear	F sharp
8	C		
9	D		
+	E		
−	F		
S	A		
T	G.		

5,151,874

INTEGRATED CIRCUIT FOR SQUARE ROOT OPERATION USING NEURAL NETWORK

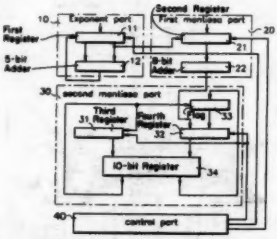
Ho-sun Jeong, and Hyo-jin Han, both of Taegu, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 26, 1990, Ser. No. 617,813

Claims priority, application Rep. of Korea, Apr. 3, 1990, 90-4516

Int. Cl.[5] G06F 7/552

U.S. Cl. 364—752 **13 Claims**



1. An integrated circuit for computing a square root of an input member using neural network circuits, the integrated circuit comprising:

exponent means for computing the exponent of a square root of an input operand, said exponent means comprising a 5-bit adder and a first register, the 5-bit adder operating on the contents of the first register and the first register storing the result of the operation by the 5-bit adder;

first mantissa means for preprocessing the mantissa of the input operant and shifting the binary digits of the mantissa depending on an output from said exponent means;

second mantissa means for computing the square root of the output from said first mantissa means; and

control means for controlling the timing of signals inputted to and outputted from said exponent means, said first mantissa means, and said second mantissa means so that a sequence of procedures for computing a square root can be executed in a predetermined sequence,

said second mantissa means outputting the mantissa of the square root of the input operand and said exponent means outputting the exponent of the square root of the input operand after said predetermined sequence of procedures for computing a square root has been completed.

5,151,875

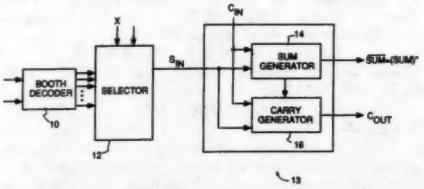
MOS ARRAY MULTIPLIER CELL

Tai Sato, Mountain View, Calif., assignor to C-Cube Microsystems, Inc., San Jose, Calif.

Continuation of Ser. No. 494,607, Mar. 16, 1990, abandoned. This application Oct. 2, 1991, Ser. No. 770,738

Int. Cl.[5] G06F 7/50, 7/52

U.S. Cl. 364—784 **5 Claims**



1. An array multiplier cell, receiving first, second and third input signals, and providing a carry-out signal and a sum signal, said array multiplier cell comprises:

sum generation means receiving said first, second and third

input signals for providing said sum signal, said sum generation means comprising first and second equivalence circuits, each equivalence circuit receiving first and second equivalence input signals and providing first and second equivalence output signals, said first equivalence output signal having a logic state in accordance with whether the logic states of said first and second equivalence input signals are the same, said second equivalence output signal being the inverted signal of said second equivalence input signal, said first equivalence circuit receiving as first and second equivalence input signals respectively said first and second input signals, and said second equivalence circuit receiving as first and second equivalence input signals respectively said first equivalence output signal of said first equivalence circuit and said third input signal, said sum generation means further comprises means for inverting said first equivalence output signal of said second equivalence circuit to provide said sum signal; and

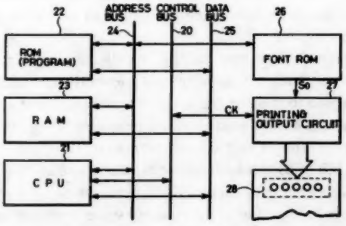
carry generation means receiving first, second, third and fourth input carry input signals, respectively coupled to said third signal, said first equivalence output signal of said first equivalence circuit, said second equivalence output signal of said first equivalence circuit, and said second equivalence output signal of said second equivalence circuit for providing said carry-out signal.

5,151,876

READ-ONLY MEMORY HAVING DATA REGISTER FOR HOLDING OUTPUT DATA

Toshio Ikeda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1989, Ser. No. 389,142
Claims priority, application Japan, Aug. 6, 1988, 63-196860
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—94 **8 Claims**



1. A read-only memory for supplying font data to a printer, comprising:

a read-only memory array having a plurality of cells in each of which said font data is capable of being stored,

decoder means responsive to an externally applied address signal for reading out said font data as parallel data from the address designated;

information holding means for holding said parallel data read out from said read-only memory array and supplying said font data as serial data in response to an externally applied clock signal received from said printer; and

first command signal generating means for generating a first command signal,

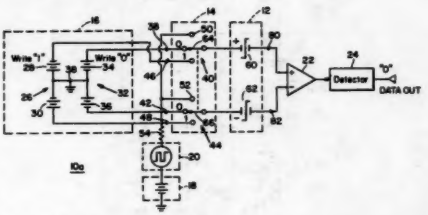
said information holding means holding said read out information in response to said first command signal generated by said first command signal generating means.

5,151,877

FERROELECTRIC SPACE CHARGE CAPACITOR MEMORY SYSTEM

Ciaran J. Brennan, Allston, Mass., assignor to The Charles Stark Draper Lab., Inc., Cambridge, Mass.

Filed Dec. 19, 1990, Ser. No. 630,027
Int. Cl.[5] G11C *11/22*
U.S. Cl. 365—145 **4 Claims**



1. A ferroelectric space charge capacitor memory system comprising:

a ferroelectric space charge capacitor memory cell including two ferroelectric space charge capacitor memory devices;

means for applying a coercive write voltage to each of said memory devices to establish internal polarization fields and space charge regions of opposite polarities in each said device, respectively;

means for applying, to each of said devices, a bias voltage less than the coercive voltage at a rate slower than the rate of space charge formation to define a capacitive level representative of one of the polarization states;

means for introducing to each said device a read signal at a rate faster than the rate of space charge formation which together with the bias voltage is less than the coercive voltage; and

means, responsive to the read signal, for indicating the difference in charge transferred by each memory device representing the logical state of said memory cell.

5,151,878

SEMICONDUCTOR MEMORY DEVICE

Toshio Yamada, Osaka, and Michihiro Inoue, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 463,077, Jan. 10, 1990. This application Nov. 5, 1991, Ser. No. 787,859
Claims priority, application Japan, Jan. 12, 1989, 1-5239
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—189.01 **2 Claims**

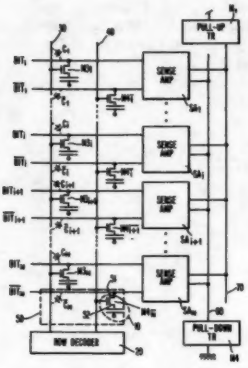
1. A semiconductor device comprising:

a plurality of memory cells capable of being selected for use or remaining unselected, at least one unselected memory cell having a logical value of "0" and having a first signal voltage potential;

at least one selected memory cell having a logical value of "1" and having a second signal voltage potential;

a first set of reading and restoring word lines connected to selected memory cells, said first set of word lines having a signal voltage potential which is higher than said second signal voltage potential by a first predetermined value; and

a second set of word lines connected to unselected memory cells, said second set of word lines having a signal voltage



potential which is higher than said first signal voltage potential by a second and different predetermined value.

5,151,879

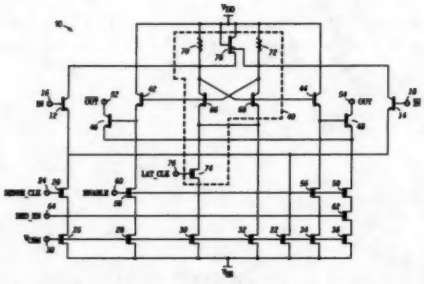
SENSE AMPLIFIER WITH LATCH

Paul W. Hsueh, Chandler, and Douglas D. Smith, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1990, Ser. No. 634,630

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—190 **13 Claims**



11. A memory sense amplifier for detecting complementary logic signals applied at first and second inputs and for providing complementary output logic signals at first and second outputs, comprising:

current source means responsive to a bias potential and having a plurality of currents respectively provided at a plurality of outputs;

a first transistor having a collector, a base and an emitter, said base being coupled to the first input of the memory sense amplifier;

a second transistor having a collector, a base and an emitter, said base of said second transistor being coupled to the second input of the memory sense amplifier, and said emitter of said second transistor being coupled to said emitter of said first transistor;

a third transistor having first, second and control electrodes, said first electrode being coupled to said emitter of said first transistor, said second electrode being coupled to a first output of said current source means, and said control electrode being coupled to a first control signal;

a fourth transistor having a collector, a base and an emitter, said collector of said fourth transistor being coupled to said collector of said first transistor;

a fifth transistor having a collector, a base and an emitter, said collector of said fifth transistor being coupled to said collector of said second transistor and to said base of said fourth transistor, said base of said fifth transistor being coupled to said collector of said fourth transistor, and said emitter of said fifth transistor being coupled to said emitter of said fourth transistor;

a sixth transistor having first, second and control electrodes, said first electrode of said sixth transistor being coupled to said emitter of said fourth transistor, said second electrode of said sixth transistor being coupled to a second output of said current source means, and said control electrode of said sixth transistor being coupled to a second control signal;

a seventh transistor having a collector, a base and an emitter, said collector of said seventh transistor being coupled to first supply voltage terminal, and said base of said seventh transistor being coupled to said base of said fourth transistor;

an eighth transistor having a collector, a base and an emitter, said collector of said eighth transistor being coupled to said first supply voltage terminal, and said base of said eighth transistor being coupled to said base of said fifth transistor;

a ninth transistor having first, second and control electrodes, said first electrode of said ninth transistor being coupled to said emitter of said seventh transistor, said second electrode of said ninth transistor being coupled to a third output of said current source means, and said control electrode of said ninth transistor being coupled to a third control signal;

a tenth transistor having first, second and control electrodes, said first electrode of said tenth transistor being coupled to said emitter of said eighth transistor, said second electrode of said tenth transistor being coupled to a fourth output of said current source means, and said control electrode of said tenth transistor being coupled to said third control signal;

an eleventh transistor having a collector, a base and an emitter, said collector of said eleventh transistor being coupled to the first output of the memory sense amplifier, and said base of said eleventh transistor being coupled to said emitter of said seventh transistor;

a twelfth transistor having a collector, a base and an emitter, said collector of said twelfth transistor being coupled to the second output of the memory sense amplifier, said base of said twelfth transistor being coupled to said emitter of said eighth transistor, and said emitter of said twelfth transistor being coupled to said emitter of said eleventh transistor;

a thirteenth transistor having first, second and control electrodes, said first electrode of said thirteenth transistor being coupled to said emitter of said twelfth transistor, said second electrode of said thirteenth transistor being coupled to a fifth output of said current source means, and said control electrode of said thirteenth transistor being coupled to said third control signal;

a first resistor coupled between said collector of said fourth transistor and said first supply voltage terminal; and

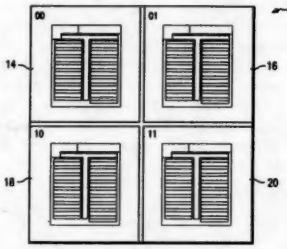
a second resistor coupled between said collector of said fifth transistor and said first supply voltage terminal.

5,151,880

METHOD AND APPARATUS FOR DETERMINING THE FIELD POSITION OF AN INTEGRATED CIRCUIT WITHIN A RETICLE AREA

John F. Schreck, and Phat C. Truong, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 14, 1989, Ser. No. 450,808
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—201 28 Claims



25. An integrated circuit, comprising:

an array of memory cells, said array producing an output signal on an output line during a normal operation mode;

a test mode memory, said test mode memory producing an output signal on said output line during a test mode;

a coupling circuit for coupling said output line to an output node in response to a control signal, said coupling circuit having a control input for receiving said control signal; and

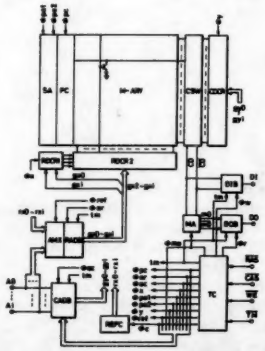
a switch for selectively coupling a normal operation mode address input to said control input in response to a first state of a test mode signal and coupling a test mode address input to said control input in response to a second state of said test mode signal.

5,151,881

SEMICONDUCTOR MEMORY INCLUDING AN ARRANGEMENT TO PERMIT EXTERNAL MONITORING OF AN INTERNAL CONTROL SIGNAL

Kazuhiko Kajigaya, Ohme, and Jiro Sawada, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 485,406
Claims priority, application Japan, Apr. 24, 1987, 62-99777
Int. Cl.[5] G11C *7/00, 11/412*
U.S. Cl. 365—233 30 Claims



1. A semiconductor memory comprising:

a memory array including therein a plurality of memory cells for storing data;

select means coupled to said memory array for selecting at least one memory cell from said plurality of memory cells;

control means coupled to said select means for forming at least one internal control signal for controlling said select means;

a first external terminal coupled to said select means; and

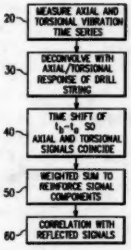
control signal transmitting means for transmitting said at least one internal control signal to said first external terminal under predetermined conditions to permit external monitoring of said internal control signal.

5,151,882

METHOD FOR DECONVOLUTION OF NON-IDEAL FREQUENCY RESPONSE OF PIPE STRUCTURES TO ACOUSTIC SIGNALS

John E. E. Kingman, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 564,621, Aug. 8, 1990, abandoned. This application Dec. 20, 1990, Ser. No. 630,866
Int. Cl.[5] G01V *1/36, 1/40*
U.S. Cl. 367—82 16 Claims



1. A method for reducing the effects of frequency-dependent distortion on vibrations generated at a first location of a structure and detected over time at a second location, said detected vibrations represented as a first time series corresponding to vibrations having a first transmission velocity along said structure and a second time series corresponding to vibrations having a second transmission velocity along said structure, said method comprising:

storing a first frequency response characteristic for said vibrations having a first transmission velocity along said structure;

storing a second frequency response characteristic for said vibrations having a second transmission velocity along said structure;

retrieving the values of said time series over at ime interval;

combining said first frequency response characteristic with a first time delay value to arrive at a first deconvolution operator;

combining said second frequency response characteristic with a second time delay value to arrive at a second deconvolution operator;

wherein the product of said first velocity and said first time delay value is approximately the same as the product of said second velocity and said second time delay value; and

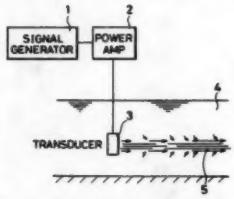
deconvolving said retrieved time series values with deconvolution operator.

5,151,883

FLUID DRIVE METHOD USING ULTRASONIC WAVES

Hideto Mitome, Tsukuba, Japan, assignor to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Mar. 22, 1991, Ser. No. 673,407
Claims priority, application Japan, Mar. 28, 1990, 2-79678
Int. Cl.[5] H04R 17/00
U.S. Cl. 367—138 2 Claims



1. A method of driving a fluid by transmitting ultrasound through the fluid, comprising the steps of:

applying electrical signals to a transducer disposed in the fluid to cause the transducer to emit tone burst waves in the fluid; and

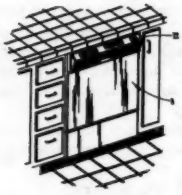
adjusting the electric signals to be applied so as to change the duty ratio and amplitude of the tone burst waves to be emitted, thereby controlling the intensity distribution of a streaming driving force acting on the fluid, such that effective use is made of ultrasonic energy by controlling of the intensity at at least one desired location, wherein the duty ratio is the ratio of the time in a burst cycle during which the transducer generates wave motion to the total time of a burst cycle.

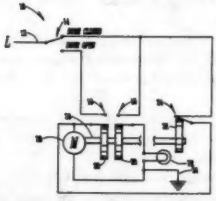
5,151,884

CONTROL SYSTEM FOR APPLIANCE INDICATOR LIGHT AND METHOD FOR USING SAME

Scott E. Griffith; Barry E. Tuller, and Charles L. Jackson, all of Newton, Iowa, assignors to Maytag Corporation, Newton, Iowa

Filed Mar. 2, 1992, Ser. No. 844,148
Int. Cl.[5] G04B 47/00; G06F 15/46
U.S. Cl. 368—10 17 Claims





1. A control system for controlling an indicator light for an appliance after said appliance has completed an operational cycle, said appliance having an access door being in a closed position during said operational cycle and movable to an open position, said control system comprising:

an electrical power source;

door switch means connected to said power source and being movable to a first posture in response to said door being moved to said open position and being movable to a second posture in response to said door being moved to said closed position;

timing means connected to said door switch and being operable responsive to said door switch moving to said first posture after completion of said operational cycle for causing initiation of a timing cycle which continues for a predetermined period of time;

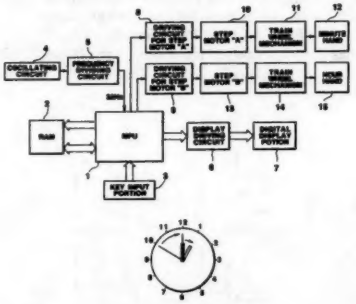
controller means connected to said timing means and said power source for connecting said power source to said indicator light until said timing means completes said timing cycle, and for disconnecting said indicator light from said power source when said timing means completes said timing cycle.

5,151,885

STOPWATCH

Tomoo Kasuo, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1992, Ser. No. 858,342
Claims priority, application Japan, Mar. 29, 1991, 3-66845
Int. Cl.[5] G04F 8/00, 10/00
U.S. Cl. 368—110 18 Claims



1. A stopwatch comprising:

time measuring means which starts time measurement on a basis of a start command;

a lap switch to be operated during a time measurement by the time measuring means;

lap time means for obtaining time information from the preceding operation of the lap switch when the lap switch is operated; and

hand means rotatably driven to a position of "0" o'clock when said lap switch is operated, and to a position of "10" o'clock when the same time as the time information obtained by said lap time means is elapsed.

5,151,886

ANALOG ELECTRIC TIMEPIECE USING AN INTERMITTENT DRIVING SIGNAL

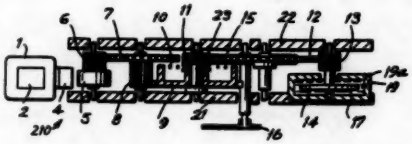
Osamu Miyazawa, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 414,288, Sep. 29, 1989, abandoned, which is a continuation of Ser. No. 114,315, Oct. 28, 1987, Pat. No. 4,885,730. This application Feb. 27, 1992, Ser. No. 845,513

Claims priority, application Japan, Oct. 28, 1986, 61-256311; Nov. 7, 1986, 61-265204; Nov. 28, 1986, 61-183447; Feb. 27, 1987, 62-28635; Feb. 27, 1987, 62-28636; Mar. 9, 1987, 62-53454; Jun. 3, 1987, 62-139281; Jul. 6, 1987, 62-168179

Int. Cl.[5] G04C *3/00*; H02K *47/10*

U.S. Cl. 368—157 26 Claims



1. An electronic timepiece, comprising:

transducer means for producing an intermittent driving force;

energy storage means coupled to the transducer means for converting the intermittent driving force to stored energy;

viscous control means for continuously releasing the stored energy as a driving force; and

hand means for indicating time and for continuous rotation in response to the release of stored energy as a driving force, the amount of rotation being based on said intermittent driving force;

wherein said energy storage means and said control means are positioned away from the center of the timepiece and separated from each other.

5,151,887

SEPARATION-TYPE OPTICAL INFORMATION RECORDING AND REPRODUCING APPARATUS PRODUCING OFFSET-ELIMINATED FOCUS ERROR SIGNAL

Yasuhiro Miyazaki, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1990, Ser. No. 511,301

Claims priority, application Japan, Apr. 20, 1989, 1-98674; Jul. 27, 1989, 1-192711; Oct. 9, 1989, 1-263387

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.32 7 Claims

1. An optical information recording and reproducing apparatus, comprising:

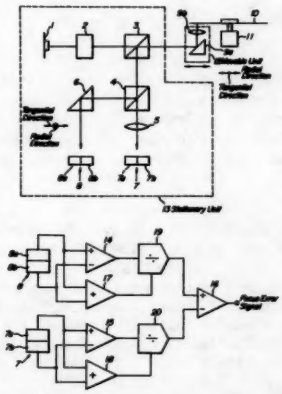
(a) a stationary unit which is fixed with respect to an optical record disk in which at least one circular information track is formed; and

(b) a movable unit which is arranged movably in a radial direction of the information track in the optical record disk,

said stationary unit comprising a light source for emitting a light beam, a first beam splitting means for directing the light beam emitted from the light source to the movable unit and directing a light beam transmitted from the movable unit in a direction which is different from a direction toward the light source, a second beam splitting means for separating the light beam emanating from the first beam splitting means into two sub-beams, a first photodetecting means having a least two light receiving regions arranged in a tangetial direction of the information track, a second photodetecting means having at least two light receiving elements arranged in the tangetial direction of the information track, and a focusing error detecting optical element arranged in the first sub-beam emanating from the second beam splitting means, said focusing error detecting optical element introducing a change in a light amount distribution of the first sub-light beam in the tangential direction;

said movable unit comprising an objective lens for projecting the light beam emanating from said first beam splitting means onto the optical record disk as a light spot; and

(c) a calculating circuit means for deriving a focus error signal from a first signal supplied from the first photodetecting means and including a signal component representing the focus error and a second signal supplied from said second photodetection means and having a signal component representing a change in the light amount distribution in the tangential direction due to factors other than the focus error, wherein said calculating circuit means comprises a first differential amplifier for deriving a first difference signal between the output signals supplied from the first photodetecting means, a first adder for deriving a first sum of the output signals supplied from the first photodetecting means, a first divider for deriving as said first signal a first division signal between the first difference and sum signals, a second differential amplifier for deriving a second difference signal between the output signals supplied from the second photodetecting means, a second adder for deriving a second sum of the output signals supplied from the second photodetecting means, a second divider for deriving as said second signal a second division signal between the second difference signal and the sum signal, and a third differential amplifier for deriving a third difference signal between said first and second division signals as the actual focus signal.



5,151,888

OPTICAL INFORMATION PROCESSING APPARATUS IN WHICH THE OUTPUT OF AN OPTICAL SENSOR IS REPLACED BY A REFERENCE SIGNAL DURING THE OCCURRENCE OF MALFUNCTION

Satoshi Shikichi, and Takashi Nakahara, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1989, Ser. No. 400,107

Claims priority, application Japan, Aug. 31, 1988, 63-215254

Int. Cl.[5] G11B *7/095*

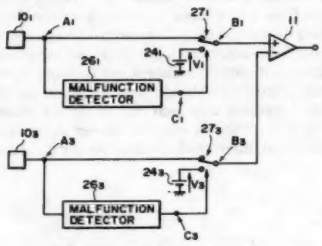
U.S. Cl. 369—44.32 8 Claims

1. An optical information processing apparatus for effecting the recording and/or reproduction of information by scanning information tracks of an optical recording medium by at least one condensed light beam while effecting tracking and/or focusing control, said apparatus comprising:

at least two groups of optical sensors for receiving light of the light beam reflected by the medium and for generating respective output signals;

a control signal producing circuit for producing a signal for effecting the tracking and/or focusing control using the output signal of each of said groups of optical sensors;

a plurality of reference signal generating sources for generating a plurality of reference signals; and



a switching circuit for cuasing, when at least one of the output signals of said groups of optical sensors exhibits an abnormal value, a respective reference signal, instead of the at lest one output signal having an abnormal value, to be input to said control signal producing circuit.

5,151,889

OPTICAL HEAD DEVICE USING CROSS-POLARIZED FROM A LIGHT SOURCE FOR USE IN OPTICAL DISK SYSTEM

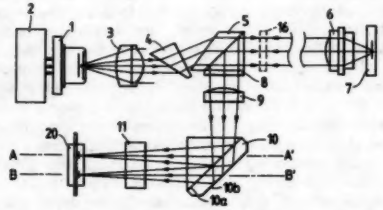
Tetsuo Saimi, and Kazuo Momoo, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 19, 1990, Ser. No. 467,119

Claims priority, application Japan, Jan. 20, 1989, 1-12328; Jan. 20, 1989, 1-12329

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.37 **8 Claims**



1. An optical head device for optically recording and reproducing information on and from an optical recording medium, comprising:

light source means for emitting a light beam;

collimator means for causing said light beam from said light source means to become a parallel light beam;

objective lens means for converging said parallel light beam from said collimator means on said optical recording medium;

first optical means provided between said collimator means and said objective lens means for reflecting the light beam returned from said optical recording medium;

converging means for converging the light beam reflected by said first optical means;

second optical means for separating the light beam from said converging means to generate two light beams which are optically cross-polarized, said two separated light beams directing in the substantially same direction and being separated by a predetermined distance from each other, said second optical means being arranged to cause the optical path length of one of said two separated light beams to be longer than that of the other separated light beam; and

photodetector means for respectively receiving the two separated light beams from said second optical means.

5,151,890

OPTICAL SYSTEM FOR OPTICAL MEMORY DEVICE

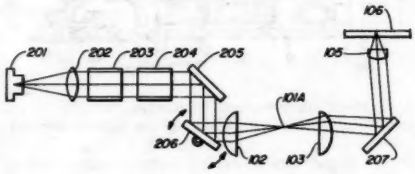
Masatoshi Yonekubo, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 520,515, May 8, 1990, abandoned. This application Feb. 26, 1992, Ser. No. 842,729

Claims priority, application Japan, May 8, 1989, 1-114621; May 18, 1989, 1-124737; Jul. 28, 1989, 1-195846

Int. Cl.[5] G11B *7/09*

U.S. Cl. 369—44.110 **12 Claims**



1. An optical system for an optical storage medium having a light source for producing a light beam, an afocal optical system, an objective lens and a reflection device, said reflection device having a deflecting mechanism for changing the propagating angle of said light beam through the optical system so as to enable a light spot focused from said light beam to follow a change in position of a track on said optical storage medium, the improvement comprising the positioning of said afocal optical system in the light path between said objective lens and said deflecting mechanism wherein said deflection mechanism is located before said afocal optical system and said objective lens is located after said afocal optical system to enable said afocal optical system to correct for displacement of said light beam due to the mechanics of said deflection mechanism, said afocal optical system comprising a first optical system having a positive focal length to receive the light beam from said deflecting mechanism and a second optical system with a positive focal length to transmit the light beam to said objective lens.

5,151,891

METHOD AND APPARATUS FOR ASSIGNING BINARY VALUES TO SAMPLE VALUES OF A WAVEFORM REPRESENTING A PATTERN OF RECORDING MARKS ON A RECORD CARRIER

Johannes W. M. Bergmans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1989, Ser. No. 427,674

Claims priority, application United Kingdom, Nov. 9, 1988, 8826266

Int. Cl.[5] H04N *5/76*; G11B *5/09, 7/00*

U.S. Cl. 369—59 **13 Claims**

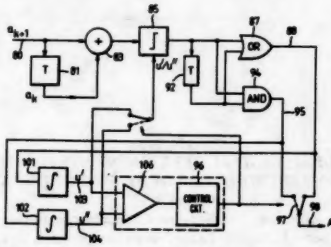
1. A method of assigning binary values to each of a series of successive sample values taken periodically from a waveform representing a binary pattern of marks on a record carrier, the pattern of marks having a nominal minimum run length of more than one sampling period, the method comprising the steps of:

(a) determining whether the pattern of marks is subject to a first or a second type of systematic error, the first type causing the marks on the record carrier to be systematically too short and the second type causing the marks on the record carrier to be too long relative to the nominal minimum run length; and

for each sample value a_k in said series:

(b) combining a series of successive sample values which include the sample value a_k to generate one or more combined sample values;

(c) establishing a threshold value;



(d) comparing each combined sample value determined in step (b) with said threshold value; and

(e) assigning a binary value to the sample value a_k in accordance with the results of the comparisons in step (d) and a logic relationship dependent on which type of systematic error, if any, is determined to be present in step (a).

5,151,892

OPTICAL HEAD DEVICE FOR OPTIMALLY DETECTING A FOCUSSING ERROR

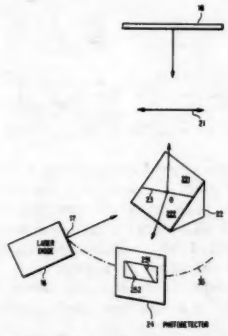
Yasuo Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 20, 1989, Ser. No. 453,894

Claims priority, application Japan, Dec. 20, 1988, 63-322496; Dec. 20, 1988, 63-322497; Dec. 20, 1988, 63-322498

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—109 **12 Claims**



12. An optical head device for use in combination with an optical source for generating an optical beam along an optical axis from a source point and comprising a lens system having a magnification for focussing said optical beam substantially on an optical recording medium which reflects said optical beam to make said lens system produce a reflected beam; a reflection optical grating element, arranged between said optical source and said lens system, comprising first and second regions partitioned by a partition line intersecting said optical axis for diffracting said reflected beam into first and second diffracted beams; and an optical detector comprising first through fourth segments, segmented by a first segmentation line and a second segmentation line orthogonally intersecting said first segmentation line, for receiving said first and second diffracted beams at first and second points of convergence to produce electric output signals from said first through fourth segments, said first and second points of convergence being on said first segmentation line, wherein said partition line and said first segmentation line each has a position and direction such that said first and second points of convergence substantially follow said first segmentation line even when a wavelength of said optical beam varies.

5,151,893

OPTICAL DATA RECORDING AND REPRODUCING APPARATUS

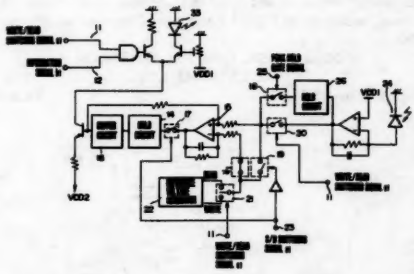
Yukihiro Yamasaki, Hirakata; Toshio Suetsugu, Katano; Tamotsu Matsuo, Osaka, and Hideo Okamura, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 30, 1990, Ser. No. 530,795

Claims priority, application Japan, Jun. 5, 1989, 1-142508; Jun. 5, 1989, 1-142509; Jun. 5, 1989, 1-142510; Jun. 5, 1989, 1-142512

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—116 **5 Claims**



1. An optical data recording and reproducing apparatus comprising:

means using a laser beam source for recording and reproducing data on and from an optical recording medium;

means for applying an information signal modulating said laser beam source, said information signal having added thereto a dummy signal having a predetermined frequency and lasting for a predetermined period of time to terminate immediately before a data write mode is started; and

means responding to said dummy signal for actuating a power servo circuit for said laser beam source.

5,151,894

DISK CARTRIDGE SHUTTER

Minoru Fujita, Toride, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 407,924, Sep. 15, 1989, abandoned. This application Dec. 18, 1991, Ser. No. 809,254

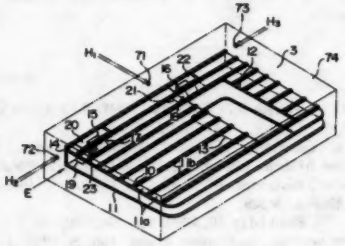
Claims priority, application Japan, Sep. 20, 1988, 63-233621

Int. Cl.[5] B11B *3/70, 5/84, 7/26, 23/03*

U.S. Cl. 369—291 **11 Claims**

1. A disk cartridge comprising a cartridge case and an integrally molded plastic shutter for shutting and opening an aperture formed in said cartridge case, said cartridge case rotatably accommodating a disk-shaped recording medium, said plastic shutter comprising face plates having an outer surface which includes a ridged surface of a multiplicity of ridges and grooves therein arranged in the form of a pattern wherein said multiplicity of ridges and grooves extend in a direction which intersects a direction of molten plastic flow when said shutter is molded, said face plate of said plastic shutter near said outer

surface, including said multiplicity of ridges and grooves, comprises a degree of molecular orientation lower in comparison with that of that portion of said face plate near an opposite inner surface thereof.

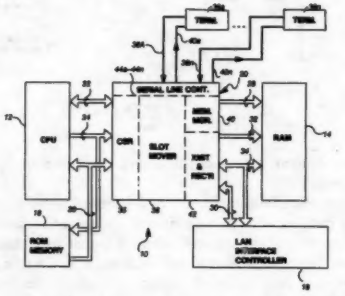


5,151,895

TERMINAL SERVER ARCHITECTURE

Gary Vacon, Melrose; John A. Visser, Wakefield; Willem A. H. Engelse, Townsend, and Stephen D. Metzger, Lancaster, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 29, 1990, Ser. No. 546,104
Int. Cl.[5] H04J 3/02
U.S. Cl. 370—85.1 **5 Claims**



2. A method for passing data from a selected one of a plurality of terminals to a local area network (LAN) using a terminal server having central processing means, data movement means for performing selected data movement operations substantially independent of said central processing means, memory and serial interface means, said serial interface means connected with each of said plurality of terminals, and said local area network (LAN) being connected to said terminal server, said method comprising the steps of:

generating first control signals from said central processing means, said first control signals identifying selected locations in said memory;

providing said first control signals to said data movement means;

generating second control signals from said data movement means;

providing said second control signals to said serial interface means for moving said data from said terminal to said serial interface means;

generating third control signals from said data movement means;

providing said third control signals to said memory for moving said data from said serial interface means to said selected locations;

generating fourth control signals from said data movement means; and

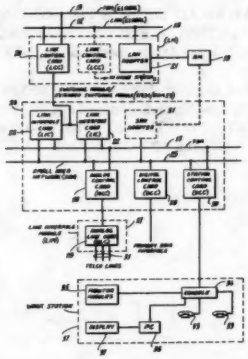
providing said fourth control signals to said LAN and said memory for moving said data from said selected locations in said memory to said LAN.

5,151,896

MODULAR DIGITAL TELEPHONE SYSTEM WITH FULLY DISTRIBUTED LOCAL SWITCHING AND CONTROL

Donald J. Bowman, 135 Grayson Ct., Colorado Springs, Colo. 80906; Jerry D. Crane, 29335 Nole Hace, Boerne, Tex. 78006; Scott G. Edwards; Kathryn M. Edwards, both of 17 Edith La., Wilton, Conn. 06895, and Sven R. Englund, 9 Fairty Dr., New Canaan, Conn. 06840

Filed Sep. 21, 1990, Ser. No. 586,440
Int. Cl.[5] H04L 12/46, 12/66
U.S. Cl. 370—85.13 **18 Claims**



1. A method of switched communication between nodes, workstations and other resources of a modular digital telephone system and public network resources such as central office telephone lines, tie lines, private and hybrid wide area networks using shared time division multiplexed (TDM) highway signal paths comprising the steps of:

mounting a plurality of circuit cards having selectable circuitry thereon in at least one card cage having a backplane;

interfacing the cards with the backplane of the card cage in which the cards are mounted;

forming a plurality of TDM highways, token passing communications media, Local Area Network (LAN) and Small Area Network (SAN), by interconnecting selected circuitry on said circuit cards on said backplane;

coupling resources to said cards permitting the intercommunication between said resources via said TDM highways;

dividing said signal paths on said TDM highways into time slots; and

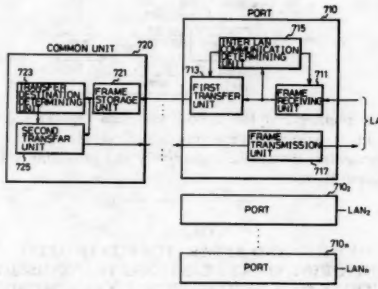
performing all call processing between resources by exchanging requests directly on said token passing communications media, SAN and LAN, between the resources wishing to communicate whereby signaling between resources is directly exchanged without establishing a direct current connection or using a central processing unit.

5,151,897

INTER-LAN CONNECTION APPARATUS AND INTER-LAN CONNECTION METHOD

Hideo Suzuki, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 6, 1991, Ser. No. 651,570
Claims priority, application Japan, Mar. 20, 1990, 2-071118
Int. Cl.[5] H04J *3/08*
U.S. Cl. 370—85.13 **20 Claims**



1. An inter-LAN connection apparatus having a plurality of ports which operatively connect to a plurality of LANs, respectively, to transmit and receive frames to and from the LANs, and a common unit that is commonly connected to the plurality of ports to transfer the frames among the LANs, each of the plurality of ports comprising:

frame receiving means for receiving a frame supplied from a corresponding LAN;

first transfer means for transferring the received frame to the common unit;

inter-LAN communication determining means for instructing said frame receiving means to abort the frame when a destination of the received frame is the LAN which is a source of transmission and for instructing said first transfer means to transfer the frame when the destination of the received frame a LAN different from the LAN that is the source of transmission; and

frame transmitting means for transmitting the frame transferred from said common unit to the corresponding LAN; and

said common unit comprises:

frame storage means for storing the frame transferred by said first transfer means;

transfer destination determining means for determining a frame transfer destination based on a destination address which is included in the frame that is stored in said frame storage means; and

second transfer means for transferring the frame stored in the frame storage means to a port designated by the frame transfer destination.

5,151,898

SYNCHRONIZED SLAVE STATION CONNECTION APPARATUS FOR A DATA COMMUNICATION NETWORK

Haruhiko Kondo, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

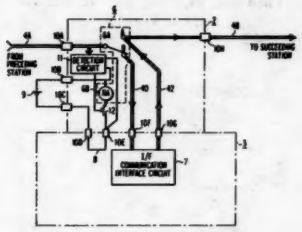
Filed Oct. 31, 1990, Ser. No. 606,974
Claims priority, application Japan, Feb. 5, 1990, 2-25601
Int. Cl.[5] H04J *3/02*; H04L *12/42*
U.S. Cl. 370—85.15 **15 Claims**

1. A ring-type data communication network having plural nodes, comprising:

a plurality of transmission means, each connecting respective pairs of nodes and collectively joining said nodes in said ring-type network;

a master station located at a first of said nodes and operative to generate a transmission frame comprising an information space and an idle space;

a plurality of slave stations, located at others of said nodes, at least one being a detachable slave station; and



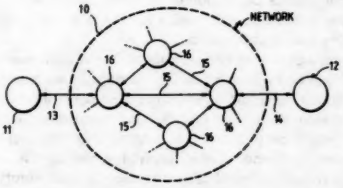
connection means located respectively at at least one of said nodes and being operative to switch between a slave station bypass state and a slave station insert state to detachably connect said at least one detachable slave station into said network in response to the appearance of said idle space.

5,151,899

TRACKING SEQUENCE NUMBERS IN PACKET DATA COMMUNICATION SYSTEM

Robert E. Thomas, Hudson; George Varghese, Bradford, both of Mass.; Robert J. Souza, Windham, N.H., and George A. Harvey, Maynard, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 11, 1991, Ser. No. 654,067
Int. Cl.[5] H04J *3/24*
U.S. Cl. 370—94.1 **34 Claims**



1. A method of tracking sequence numbers for message packets in a packet data transmission system, comprising the steps of:

a) assigning sequence numbers in order to a series of packets transmitted from a source to a destination;

b) at said destination, defining an acceptable range of said sequence numbers, said range beginning at a base sequence number and extending for a window which is a small fraction of the available sequence numbers;

c) comparing the sequence number of each message packet received at said station with said acceptable range;

d) discarding all message packets having sequence numbers not within said range;

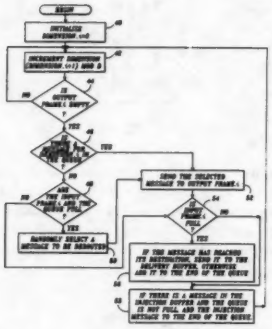
e) maintaining at said destination a first bit map, and indexing into said first bit map to a sequence number index position representing the sequence number of a packet received at said destination; and

f) for said packet received at said destination, checking its sequence number index position in said first bit map, and discarding said packet if said sequence number index position contains an indication that a packet of the sequence number of this index position has already been received, or, if said index position does not contain said indication, then storing an indication at said index position that a packet has been received.

5,151,900
CHAOS ROUTER SYSTEM

Lawrence Snyder, Seattle, Wash., and Smaragda Konstantinidou, Los Gatos, Calif., assignors to Washington Research Foundation, Seattle, Wash.

Filed Jun. 14, 1991, Ser. No. 715,828
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—94.3 **9 Claims**



1. A message router system for routing messages from a source node to a destination node in a multinode processing system, the multinode processing system includes a multiplicity of nodes connected by channels such that a message may be routed along a profitable channel so that it is closer to its destination or derouted along a random channel so that it is further from its destination, wherein each node includes a routing subsystem having a set of input frames corresponding to the channels for receiving messages from the channels, a set of output frames corresponding to the channels for sending messages to the channels, and a fixed-size message queue for storing messages at the node,

the message router system comprising at each node:

(a) a routing controller for identifying an empty output frame, selecting a profitable message from the message queue such that the channel corresponding to said empty output frame is a profitable channel for said message, and, if said profitable message is available, writing said profitable message to said empty output frame; and

(b) a random selector for randomly selecting a message to be derouted from said message queue if said routing controller does not identify a profitable message and if said message queue is full, and writing said derouted message to said empty output frame.

5,151,901
DS1 TRUNK PACKING AND UNPACKING APPARATUS AND METHOD

Kishan Shenoi, Milpitas; Patrick L. Hanagan; Helena S. Ho, both of San Jose, and Frank I. Yu, Saratoga, all of Calif., assignors to DSC Communications Corporation, Plano, Tex.

Filed Apr. 9, 1990, Ser. No. 506,691
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—110.1 **22 Claims**

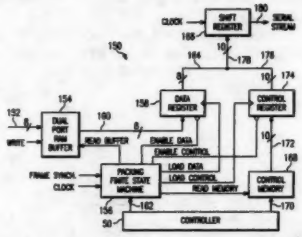
1. Apparatus for packing compressed data from a plurality of telecommunication lines, comprising:

a buffer for receiving and storing said compressed data from said plurality of telecommunication lines;

a data register coupled to said buffer for reading said compressed data from said plurality of telecommunication lines stored in said buffer;

a control memory for storing control parameters;

a control register coupled to said control memory for reading said control memory and storing said control parameters; and

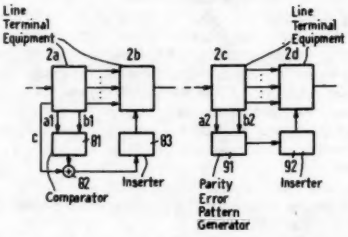


a shift register coupled to both said data register and said control register for receiving one of said data and control parameters therefrom respectively and providing a serial output thereof.

5,151,902
METHOD AND APPARATUS FOR QUALITY MONITORING OF AT LEAST TWO TRANSMISSION SECTIONS OF A DIGITAL SIGNAL TRANSMISSION LINK

Hans-Joachim Grallert, Groebenzell, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 22, 1990, Ser. No. 497,324
Claims priority, application European Pat. Off., Mar. 22, 1989, 89105172.4
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—51 **7 Claims**



1. A method for quality monitoring of at least two series connected line sections of a digital signal transmission link having transmission equipment operating according to a synchronous hierarchy, wherein digital signals are transmitted in virtual containers of synchronous transport modules and section overhead of synchronous transport modules and having module parity bytes and a special parity byte in a path overhead of each virtual container, for each line section module parity bytes derived from digital signals received at an end of the respective line section being compared to received module parity bytes received at a start of the respective line section and an error signal being formed in a prescribed dependency on a result of the comparison, comprising the steps of:

deriving an error message byte, in at least one intermediate link location of the transmission link at which an end of one line section is connected to a start of a following line section, from the error signal and transmitting the error message byte over the following line section as the special parity byte, and the error message byte being transmitted on lines that carry the digital signals between synchronous line multiplexers of the at least one intermediate link location; deriving in the following line section, a new error message byte from the error message byte received from

the one line section and an error signal formed at the end of the following line section;

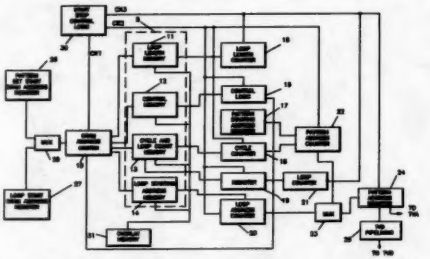
repeating the steps of forming an error message byte to produce a sequence of error message bytes of the transmission link and acquiring a quality criterion for the monitored transmission link by evaluating the sequence of error message bytes.

5,151,903

HIGH EFFICIENCY PATTERN SEQUENCE CONTROLLER FOR AUTOMATIC TEST EQUIPMENT

Marc R. Mydill, and Sheila O'Keefe, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 28, 1989, Ser. No. 414,050
Int. Cl.[5] G06F *11/00, 9/40*
U.S. Cl. 371—27 **12 Claims**



4. A pattern sequence control system for controlling the sequence of pattern memory addresses applied to pattern memory during the execution of a functional test, comprising;

a control RAM for storing the changes in the sequence of patterns that are to be executed;

a single pattern address counter for incrementing the pattern addresses in memory for sequential patterns; and

a single loop address counter for incrementing the pattern address in memory for looping patterns; and

a cycle and loop count memory storing a cycle count which represents the number of times a single pattern is to be repeated and a loop count which represents the number of times a loop is to be executed;

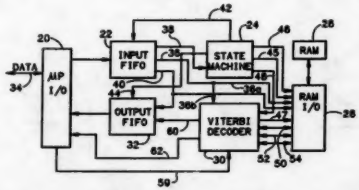
wherein the cycle count also represents the number of sequential pattern addresses to be executed in a straight line mode, and the loop count represents the maximum number of times a match loop is to be executed before logging a failure.

5,151,904

RECONFIGURABLE, MULTI-USER VITERBI DECODER

Thomas C. Reiner, Carlsbad; Mark J. Lindsey, and Krishnanand Kelkar, both of San Diego, all of Calif., assignors to The Titan Corporation, San Diego, Calif.

Filed Sep. 27, 1990, Ser. No. 590,238
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—43 **12 Claims**



1. A decoding system for decoding a digital data stream that has been convolutionally encoded in accordance with a selected constraint length and selected polynomial codes, comprising

means for processing said encoded data stream in accordance with said constraint length and in accordance with said selected polynomial codes to decode said encoded data stream;

a memory for storing data of said selected constraint length and data of said selected polynomial codes in accordance with which said data stream was encoded; and

means responsive to a user channel identification signal for retrieving said selected constraint length data and said selected polynomial code data from said memory and configuring the processing means in accordance with said selected constraint length and said selected polynomial codes;

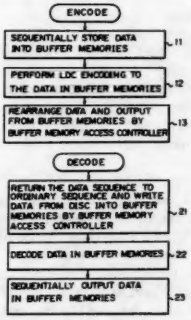
wherein the memory stores different sets of combinations of constraint length data and polynomial code data corresponding to different user channels, with said different sets being retrievable from the memory by the retrieving means in response to different user channel identification signals for respectively configuring the processing means for different user channels.

5,151,905

DATA RECORDING METHOD

Shigeru Yokono, Kanagawa, and Minoru Tobita, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 10, 1989, Ser. No. 419,388
Claims priority, application Japan, Oct. 14, 1988, 63-259143
Int. Cl.[5] H03M *13/00*
U.S. Cl. 371—39.1 **7 Claims**


ENCODE
SEQUENTIALLY STORE DATA INTO BUFFER MEMORIES
11
PERFORM LDC ENCODING TO THE DATA IN BUFFER MEMORIES
12
REARRANGE DATA AND OUTPUT FROM BUFFER MEMORIES BY BUFFER MEMORY ACCESS CONTROLLER
13
DECODE
RETURN THE DATA SEQUENCE TO ORDINARY SEQUENCE AND WRITE DATA FROM DISC INTO BUFFER MEMORIES BY BUFFER MEMORY ACCESS CONTROLLER
21
DECODE DATA IN BUFFER MEMORIES
22
SEQUENTIALLY OUTPUT DATA IN BUFFER MEMORIES
23

1. A method for recording digital data onto a disc-shaped recording medium having a sector construction, comprising the steps of:

receiving input digital data and dividing it into predetermined lengths;

two-dimensionally arranging the predetermined lengths of the divided digital data into n separate arrays, each array having rows and columns, where n is an integer greater than one;

for each array, generating separate error correction codes and adding the separate error correction codes to the columns of the array and storing each of the n arrays of digital data and error correction codes at different addresses in a digital memory means; and

sequentially reading out the digital data and error correction codes from the digital memory means and recording the read out digital data and error correction codes to each sector in series on the disc-shaped recording medium, wherein the step of reading out the digital data and error correction codes follows a sequence that the digital data or error correction code at any given set of row and column coordinates in a first one of the n arrays is read out

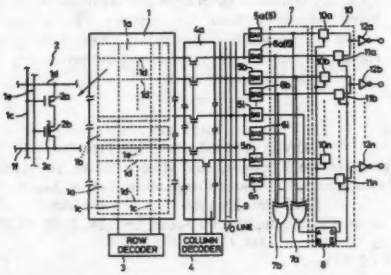
and recorded, followed by reading out and recording the digital data or the error correction code at the same given set of row and column coordinates in a second one of the n arrays, followed by reading out and recording the digital data or error correction code at the same given set of row and column coordinates in a third and each subsequent one of the n arrays.

5,151,906

SEMICONDUCTOR MEMORY DEVICE HAVING SELF-CORRECTING FUNCTION

Kikuzo Sawada, Koganei, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed May 2, 1990, Ser. No. 517,694
Claims priority, application Japan, May 25, 1989, 1-132177
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—51.1 **33 Claims**



1. A semiconductor memory device having a self-correcting function, comprising:

a plurality of nonvolatile memory cells;

first and second read circuits for reading a plurality of bits from the plurality of memory cells;

one part of the memory cells comprises memory cells for storing data bits, another part thereof being memory cells for storing parity bits on data bits stored, wherein each memory cell selectively stores bits of "0" or "1" by an electric charge;

the first read circuit having a criterion of detecting the bits of "0" and "1" set smaller in value than a current value read in such a state that the electric charge charged in the memory cell stored with data of one of either "0" or "1" becomes depleted;

the second read circuit having a criterion of detecting the bits of "0" and "1" set greater in value than a current value read in such a state that the electric charge charged in the memory cell stored with data of the other of either "1" or "0" becomes depleted; and

the first and the second read circuits being connected to respectively receive the same bits from the plurality of the same selected memory cells and having means to output correct data with correct parity out of the plurality of bits.

5,151,907

AUXILIARY POWER SUPPLY FOR CONTINUATION OF COMPUTER SYSTEM OPERATION DURING COMMERCIAL AC POWER FAILURE

Walter A. Robbins, 1110 Bel Marin Keys Blvd., Novato, Calif. 94949

Filed Feb. 20, 1990, Ser. No. 482,294
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—66 **20 Claims**

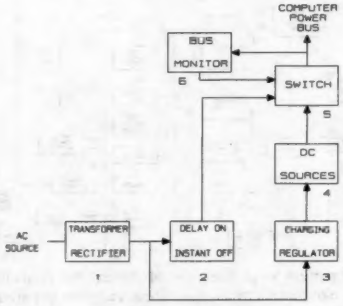
1. A means to provide auxiliary direct current power to a device to be protected utilizing low voltage direct current power converted from alternating current power, to provide uninterrupted operation during an alternating current power failure, comprising:

a) a monitoring means for monitoring an alternating current power source for failure and providing a first indication of failure when said alternating current power source falls below a predetermined voltage, and a second indication of restoration of said alternating current power whenever said alternating current power source returns to and rises above said predetermined voltage for longer than a predetermined period of time,

b) a power supply means receiving energy from said alternating current power source for converting and delivering power to said auxiliary direct current power system during nominal operation of said alternating current power source,

c) a source or sources of stored direct current power means, including storage batteries, connected to a change-over switch means,

d) said change-over switch means to connect the direct current power source(s) to a device to be protected's



internal direct current power bus, and connector means therefor, controlled by said first and second indications of power failure and restoration,

e) a means to monitor a device to be protected's on/off status,

f) a means to inhibit said change-over switch means when said device to be protected is in a turned off state,

g) a means to inhibit said change-over switch means change-of-state, following said second indication of commercial alternating current power restoral, until such time as said device to be protected's internal main direct current power supply is capable of providing nominal power,

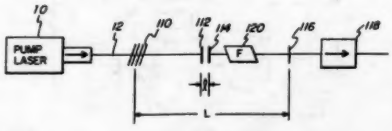
whereby an efficient and direct means is provided for substitute or auxiliary direct current power following a loss of commercial alternating current power and thereby maintaining the device to be protected's system operation for the duration of said loss.

5,151,908

LASER WITH LONGITUDINAL MODE SELECTION

David R. Huber, Warrington, Pa., assignor to General Instrument Corporation, Hatboro, Pa.

Continuation-in-part of Ser. No. 616,024, Nov. 20, 1990. This application Oct. 9, 1991, Ser. No. 770,762
Int. Cl.[5] H01S *3/30*
U.S. Cl. 372—6 **20 Claims**



1. A laser for providing an optical carrier comprising:

a first Fabry-Perot cavity of length L formed from an optical material containing a laser medium to provide a laser cavity; and

a second Fabry-Perot cavity of length $1 < L$ at least approximately centered within said first Fabry-Perot cavity;

wherein the length L of said first Fabry-Perot cavity is selected to limit the longitudinal modes of said laser cavity and the length 1 of said second Fabry-Perot cavity is selected to minimize gain except at a desired lasing wavelength.

5,151,909

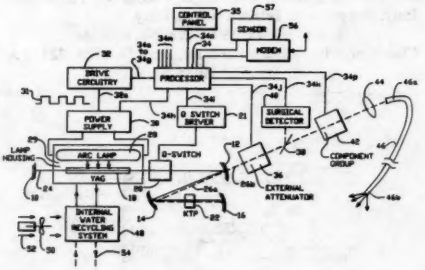
FREQUENCY DOUBLED SOLID STATE LASER HAVING PROGRAMMABLE PUMP POWER MODES AND METHOD FOR CONTROLLABLE LASERS

Scott A. Davenport, Montara; Mark V. Ortiz, San Jose; Linda Chen, Fremont, and Dirk J. Kuizenga, Sunnyvale, all of Calif., assignors to Laserscope, San Jose, Calif.

Continuation-in-part of Ser. No. 598,485, Oct. 16, 1990, abandoned. This application Apr. 22, 1991, Ser. No. 689,356

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—22 **101 Claims**



1. A laser system comprising:

a laser resonator for resonating at a first frequency;

a gain medium, mounted within the laser resonator;

controllable means, coupled with the gain medium, for supplying pump power in response to at least one control signal, to the gain medium to induce laser gain;

means, mounted with the laser resonator, for extracting an output beam at a second frequency derived from the resonating first frequency, the output beam having an output power; and

control means, connected to the controllable means, for supplying the at least one control signal to control the output power, wherein the control means supplies the at least one control signal in a first mode to generate a low output power, in a second mode to generate a high output power.

5,151,910

LIGHT QUANTITY CONTROL DEVICE

Toshihiko Inuyama; Junichi Kimizuka, both of Kanagawa; Makoto Abe, Chiba; Akihisa Kusano; Kaoru Sato, both of Kanagawa; Kazuhiko Okazawa; Masanori Ishiza, both of Tokyo, and Toshiyuki Ito, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1990, Ser. No. 588,331

Claims priority, application Japan, Sep. 26, 1989, 1-247929

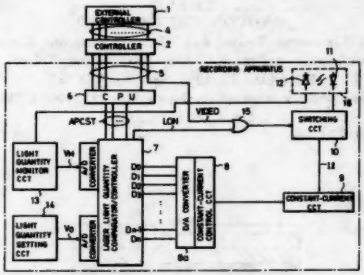
Int. Cl.[5] H01S *3/13*

U.S. Cl. 372—31 **17 Claims**

1. A light quantity control device comprising:

beam generating means; monitor means for monitoring a quantity of light of beam generated by said beam generating means and providing an output; and control means for controlling the light quantity of the beam generated by said beam generating means in response to the output of said monitor means, wherein said control means comprises:

digital value output means for outputting a digital value representing the quantity of light of the beam and a light



quantity control circuit for controlling the quantity of light in response to the digital value, and means for varying the timing of output of the digital value in accordance with the output of said monitor means so as to cause the quantity of light to be a predetermined level.

5,151,911

PROCESS FOR REDUCING HIGH-FREQUENCY ENERGY NOISE COMPONENTS IN THE OUTPUT RADIATION OF A LASER, PROCESS FOR GENERATING SHORT LASER PULSES, AND LASERS UTILIZED FOR THIS PURPOSE

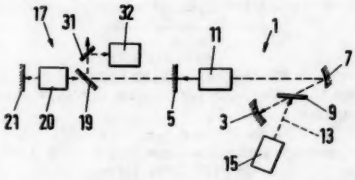
Junging Bi, Worblaufen; Paul A. Beaud, Bern; Jürg A. Schütz, Jegenstorf; Walter Hodel, Bern, and Heinz P. Weber, Breitiägertenstrasse 2, 3122 Kehrsatz, all of Switzerland, assignors to Heinz P. Weber, Kehrsatz, Switzerland

Filed Apr. 23, 1991, Ser. No. 689,487

Claims priority, application Switzerland, May 11, 1990, 1610/90

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—32 **19 Claims**



8. A laser for emitting an output radiation with reduced high-frequency energy noise, comprising

a laser resonator (1) with an active medium (9) and a mode volume,

a pumping device (15) for pumping said active medium (9),

two resonator mirrors (3, 5) in said laser resonator defining the mode volume of the oscillating laser radiation created by said active medium (9) inside said laser resonator (1),

secondary feedback means (17), including a secondary feedback path, connected to receive said output laser radiation from said laser resonator and produce a radiation feedback which is a fraction of said output laser radiation,

said secondary feedback means (17) being connected to feed back to said mode volume said fraction radiation feedback,

said secondary feedback path containing no optically nonlinearly acting components, and

said fraction radiation feedback having an intensity between

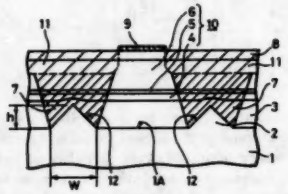
10^{-6} and 10^{-10} of the intensity of said laser radiation inside said resonator (1), and having a magnitude range of 0.5 to 50,000 times the intensity of the spontaneous output radiation of said laser resonator.

5,151,912

SEMICONDUCTOR LASER

Koushi Tamamura, Tokyo, and Hiroyuki Iwamoto, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 29, 1991, Ser. No. 783,787
Claims priority, application Japan, Nov. 2, 1990, 2-298166
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—46 **28 Claims**



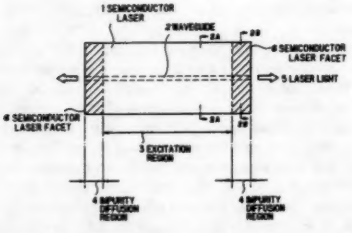
1. A semiconductor laser comprising:
a semiconductor substrate having first and second surfaces opposing to each other;
first and second cladding layers formed on the first surface of said substrate;
an active layer of a superlattice structure sandwiched between said first and second cladding layers;
a capping layer formed on said second cladding layer;
a first electrode provided on said capping layer; and
a second electrode connected to the second surface of said substrate, wherein the first surface of said substrate has at least two slanted surfaces whose crystalline planes differ from that of a major surface of said first surface of said substrate, each of said first and second cladding layers and said active layer formed on said substrate has a higher carrier density region above said slanted surfaces, and the higher carrier density regions of said active layer are placed in an alloy state, and light is emitted in a region of said active layer which is sandwiched between the alloy regions of said active layer and not placed in an alloy state.

5,151,913

SEMICONDUCTOR LASER

Yoshiyasu Ueno, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 9, 1991, Ser. No. 638,921
Claims priority, application Japan, Jan. 9, 1990, 2-3091
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—46 **4 Claims**



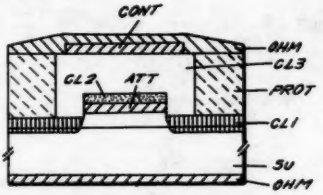
1. In a semiconductor laser, comprising:
a semiconductor substrate which has one type of conductivity;
a first cladding layer formed on said substrate, said first cladding layer having the same type of conductivity as said substrate;
a super-lattice active layer formed on said first cladding layer;
a second cladding layer formed on said active layer, said second cladding layer having the opposite type of conductivity as said first cladding layer, and said second cladding layer with said first cladding layer and said active layer forming a double-hetero structure;
impurity diffusion regions formed in all the layers of the double-hetero structure in the vicinity of both laser facets of said semiconductor laser, said active layer in said impurity diffusion regions having the impurity density of equal to or over 1×10^{17} cm^{-3}; and
a blocking layer formed on said second cladding layer in said impurity diffusion regions, said blocking layer having the same type of conductivity as said first cladding layer.

5,151,914

PROCESS TO MANUFACTURE LASER STRUCTURES WITH LATERAL CONFINEMENT AT VERY LOW THRESHOLD CURRENT AND RELEVANT LASER DEVICES SO OBTAINED

Fabio Vidimari, Milan, and Sergio Pellegrino, Turin, both of Italy, assignors to Telettra S.p.A., Italy

Filed Dec. 21, 1990, Ser. No. 631,644
Claims priority, application Italy, Dec. 21, 1989, 22770 A/89
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—46 **8 Claims**



6. A multilayer laser structure, comprising:
a substrate with an electrode formed on one surface and with the following layers, formed in the order recited, on an opposite surface:
a first epitaxial layer for optical and electric confinement;
an active layer for emitting luminous radiation of a desired wavelength;
at least one further layer for optical and electric confinement comprising a semiconductor material implanted with ions of a transition metal;
an electric contact layer; and
a second electrode attached to said electric contact layer.

5,151,915

ARRAY AND METHOD OF OPERATING A MODULATED SOLID STATE LASER ARRAY WITH REDUCED THERMAL CROSSTALK

Thomas L. Paoli, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1990, Ser. No. 634,989
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—50 **16 Claims**

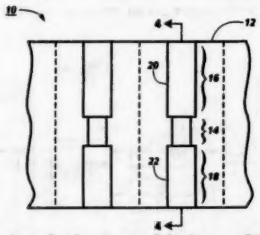
13. A light emitting device, comprising:
an array of monolithically formed independently addressable semiconductor lasers, comprising:
a semiconductor substrate;
a plurality of semiconductor layers formed on said substrate such that at least one of said layers forms an active layer of narrower bandgap than layers adjacent thereto;
a first active region formed in said active layer for each

laser, including a two dimensional optical cavity for functioning as a laser;

a second active region formed in said active layer of at least one of the lasers of the array, including a two dimensional optical cavity coaxial with said optical cavity of said first active region for functioning as an optical modulator;

means electrically connected to said second active region for selectively applying a bias across said second active region;

wherein a sufficient forward bias is applied to said first



active region of at least one of the lasers of the array such that stimulated emission is caused to occur therein, a portion of said stimulated emission being directed into said second active region of said at least one laser, and the internal loss of the second active region of said at least one laser is varied by selectively applying the voltage to said second active region such that when said voltage is applied to said second active region the stimulated emission is prevented from causing lasing within said at least one laser, and when said voltage is not applied to said second active region the stimulated emission is allowed to cause lasing within said at least one laser.

5,151,916

ELECTRIC DISCHARGE TUBE FOR GAS LASER

Nobuaki Iehisa, Yamanashi, and Etsuo Yamazaki, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

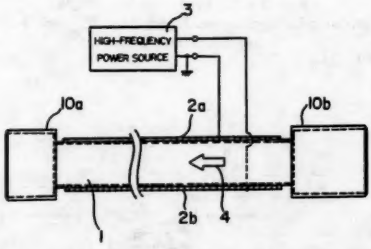
PCT No. PCT/JP89/00856, § 371 Date Apr. 18, 1990, § 102(e) Date Apr. 18, 1990, PCT Pub. No. WO90/03052, PCT Pub. Date Mar. 22, 1990

PCT Filed Aug. 22, 1989, Ser. No. 474,043

Claims priority, application Japan, Sep. 9, 1988, 63-226994

Int. Cl.[5] H01S *3/03*

U.S. Cl. 372—61 **7 Claims**



1. An electric discharge tube for a gas laser in which a laser gas flow axis and a laser oscillation optical axis are coaxial and a discharge direction for discharge pumping is perpendicular to said axes, comprising:

a discharge section made of quartz glass and having two opposite axial ends, an internal cross-sectional shape of said discharge section being square and measuring approximately 19 mm by 19 mm; and

a non-discharge section disposed at each opposite axial end of said discharge section for supporting the discharge section;

an internal sectional form of said discharge section perpendicular to the laser oscillation optical axis is made rectangular and an internal diameter of said non-discharge section is made larger than a diagonal line extending across a cross-section of said discharge section.

5,151,917

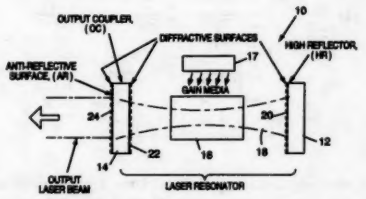
LASER RESONATORS EMPLOYING DIFFRACTIVE OPTICAL ELEMENTS

Bruce Perilloux, Grass Valley; Arnold Bloom, Menlo Park; Dennis Fischer, Auburn; Larry Giammona, Grass Valley, and Thomas F. Johnston, Auburn, all of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Apr. 18, 1991, Ser. No. 687,334

Int. Cl.[5] H01S *3/08*

U.S. Cl. 372—102 **26 Claims**



1. A laser comprising:

a resonant cavity;

a gain medium located within the resonant cavity;

means for exciting the gain medium to generate a laser beam; and

a diffractive optical element (DOE) for focusing the beam, said DOE being defined by an optical microstructure formed on a substrate, said optical microstructure for diffracting the laser beam, said DOE being located either within the resonant cavity or formed integrally with said resonant cavity such that the beam must be diffracted by the DOE before it exits the resonant cavity.

5,151,918

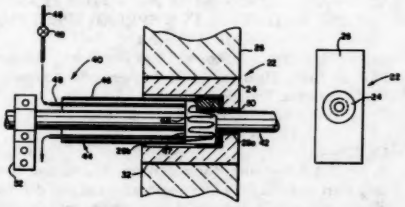
ELECTRODE BLOCKS AND BLOCK ASSEMBLIES

Ronald D. Argent, 9319 Chase Pl., Allison Park, Pa. 15101; Richard A. Ruthers, 4308 Lynnbrook Dr., Louisville, Ky. 40220, and Roy A. Webber, 72 S. Florida St., Buckhannon, W. Va. 26201

Filed Aug. 28, 1990, Ser. No. 574,332

Int. Cl.[5] C03B *5/02*

U.S. Cl. 373—27 **19 Claims**



1. An electrode block assembly for use with electrode means melting glass in a glass melting furnace receiving the block assembly, the block assembly comprising:

a first block of a first refractory composition, the first block having a passageway therethrough configured to receive at least part of an electrode means extended entirely through the first block; and

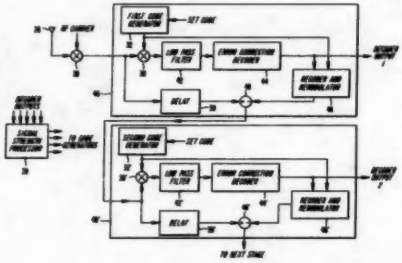
a second block of a second refractory composition, the second block having a passageway therethrough configured to receive at least part of the first block and an electrode means extended entirely through the first block.

5,151,919

CDMA SUBTRACTIVE DEMODULATION

Paul W. Dent, Stehag, Sweden, assignor to Ericsson-GE Mobile Communications Holding Inc., Paramus, N.J.

Filed Dec. 17, 1990, Ser. No. 628,359
Int. Cl.[5] H04K *1/00*
U.S. Cl. 375—1 **35 Claims**



1. A multiple access, spread spectrum communications system for communicating information signals between plural stations using code division spread spectrum communications signals, each station comprising:

transmission means for spreading an information signal with a corresponding spreading code and for transmitting a spread-coded signal, and

receiving means for receiving a composite signal of plural, overlapping spread-coded signals, including:

code ordering means for ordering individual spreading codes in an order according to relative strengths of said information signals;

decoding means for recursively decoding said composite signal with a first ordered spreading code received from said code ordering means to generate a series of decoded signals;

recoding means for successively recoding said decoded signals using corresponding spreading codes to generate a series of recoded signals;

signal removal means for successively removing said recoded signals from said composite signal; and

code selection means for successively selecting a next, ordered code from said code ordering means.

5,151,920

RADIO LAN STATION WITH IMPROVED FRAME DELIMITER DETECTION IN A SPREAD SPECTRUM ENVIRONMENT

Johannes P. N. Haagh, Eindhoven; Hans van Driest, Bilthoven, and Gerrit Smit, Haaften, all of Netherlands, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 10, 1991, Ser. No. 757,392
Int. Cl.[5] H04L *27/30, 9/00*
U.S. Cl. 375—1 **10 Claims**

2. A radio LAN station for receiving information frames including start and end delimiters, said start and end delimiters including data symbols and non-data symbols, said data symbols and non-data symbols being transmitted via a spread spectrum signal and being spread via first and second spreading codes, respectively, said station comprising:

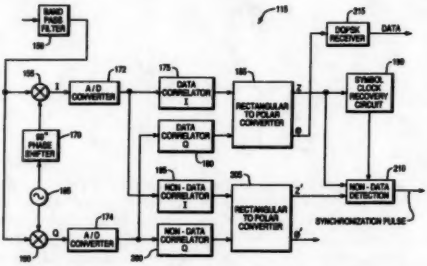
down-converting means for down-converting said spread spectrum signal to produce a down-converted spread spectrum signal;

analog to digital conversion means, coupled to said down-converting means, for providing a digital representation of said down-converted spread spectrum signal;

first correlating means, coupled to said analog to digital conversion means, for correlating a digital representation of said down-converted spread spectrum signal against said first spreading code to produce a rectangular representation of said data symbols;

second correlating means, coupled to said analog to digital conversion means, for correlating a digital representation of said down-converted spread spectrum signal against said second spreading code to produce a rectangular representation of said non-data symbols;

first converting means, coupled to said first correlating means, for converting said rectangular representation of



said data symbols into a polar representation of said data symbols to produce a vector length Z representative thereof;

second converting means, coupled to said second correlating means, for converting said rectangular representation of said non-data symbols into a polar representation of said non-data symbols to produce a vector length Z′ representative thereof; and

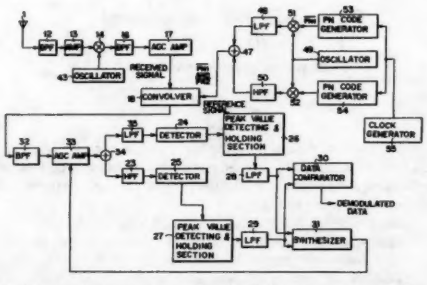
comparing means, coupled to said first and second converting means, for comparing said vector lengths Z and Z′ to determine that a symbol is a data symbol if Z—Z′ is greater or equal to a constant A, or that a symbol is a non-data symbol if Z—Z1 is less than said constant A, such that the data and non-data symbols representing said start and end delimiters are detected.

5,151,921

SPREAD SPECTRUM COMMUNICATION DEVICE

Takeshi Hashimoto, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1991, Ser. No. 748,941
Claims priority, application Japan, Aug. 28, 1990, 2-227537
Int. Cl.[5] H04L *27/30*
U.S. Cl. 375—1 **6 Claims**



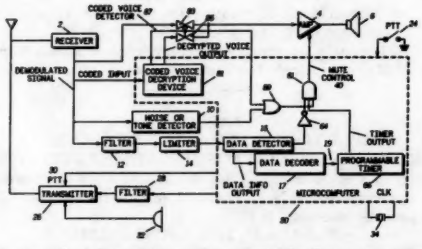
1. A spread spectrum communication system, comprising:

a transmitter which includes:
a first PN code generator for generating a first PN code;
first modulating means for modulating a predetermined carrier wave with said first PN code outputted by said first PN code generator;
switching means for separating modulated signals from said first modulating means into two parts in response to information data;
a first filter which passes the lower band of one of the two parts separated by said switching means;
a second filter which passes the upper band of the other of the two parts separated by said switching means; and
synthesizing means for combining outputs of said first and said second filters; and
a receiver which includes:
a second PN code generator for generating a second PN code, which is inverted in time with respect to said first PN code in the transmitter;
second modulating means for converting the second PN code outputted by said second PN code generator in frequency by using a predetermined carrier signal;
correlating means for correlating a received signal with the output of said second modulating means;
a third filter which passes the lower band component of the spectre outputted by said correlating means;
a fourth filter which passes the upper band component of the spectre outputted by said correlating means; and
data comparing means, which reproduced the information data, while comparing the output level of said third filter with the output level of said fourth filter.

5,151,922
VARIABLE SPEAKER MUTING BASED ON RECEIVED DATA

Karl R. Weiss, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 24, 1990, Ser. No. 586,667
Int. Cl.[5] H04L *25/00*
U.S. Cl. 375—5 **12 Claims**

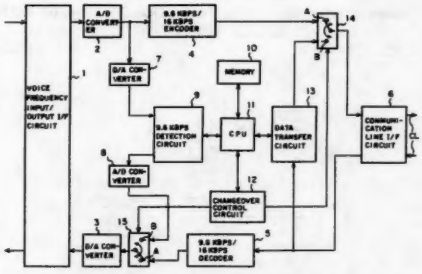


1. A method for muting audio output of a first communication device by a second communication device, comprising the steps of:
in said second communication device:
transmitting a data signal and a subsequent signal having a signal type, in the same transmission, said data signal specifying the signal type of said subsequent signal, and said signal type of said subsequent signal having a specified mute time variable for setting a mute duration for said audio output; and
in said first communication device:
receiving and detecting said data signal and said subsequent signal;
muting said audio output of said first communication device from the end of the time when said data signal is received, to the end of said mute duration, when said subsequent signal is detected, in response to said specified mute duration; and
unmuting the audio output of said first communication device after said specified mute duration, if said subsequent signal, is a voice type signal.

5,151,923
VOICE FREQUENCY COMMUNICATION APPARATUS

Genichi Fujiwara, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1989, Ser. No. 371,822
Claims priority, application Japan, Jun. 28, 1988, 63-157947; May 24, 1989, 1-128870
Int. Cl.[5] H04B *1/38, 1/46*
U.S. Cl. 375—5 **16 Claims**



1. A voice frequency communication apparatus for converting an original analog signal of voice frequency bandwidth to an original digital signal through a first A/D converter, encoding the original digital signal to a signal of predetermined transmission rate, outputting the encoded original digital signal to a communication line through a communication line I/F circuit, decoding a return digital signal of the predetermined transmission rate input through the communication line I/F circuit from the communication line, converting the decoded return digital signal into a return analog signal and outputting the return analog signal to a transmission line, said apparatus comprising:
a predetermined level D/A converter for converting a branched signal of the original digital signal, generated from said first A/D converter, into a duplicate of the original analog signal,
a detection circuit for receiving the duplicate of the original analog signal, for determining whether the duplicate of the original analog signal is a non-voice frequency terminal signal or a voice frequency terminal signal, for generating a voice/non-voice flag dependent on the determination, for converting the duplicate of the original analog signal to a duplicate digital signal,
a CPU for receiving the duplicate digital signal from said detection circuit,
a data transfer circuit for receiving the duplicate digital signal from said CPU, for selecting one of the encoded original digital signal and the duplicate digital signal from said CPU depending on the generated voice/non-voice flag using a first selector and temporarily storing the selected digital signal,
branching means for receiving the return digital signal from said communication line I/F circuit and generating a duplicate of the return digital signal,
said detection circuit receiving the duplicate of the return digital signal from said branching means via said data transfer circuit and said CPU and converting the duplicate of the return digital signal into a duplicate return analog signal,
an A/D converter for converting the duplicate return analog signal to a duplicate return digital signal, and
a changeover control circuit for selecting either the decoded

return digital signal or the duplicate return digital signal depending on the generated voice/non-voice flag,

said CPU controlling said data transfer circuit and said changeover control circuit to ensure proper two-way communication by said voice frequency communication apparatus.

5,151,924

AUTOMATIC EQUALIZATION METHOD AND APPARATUS

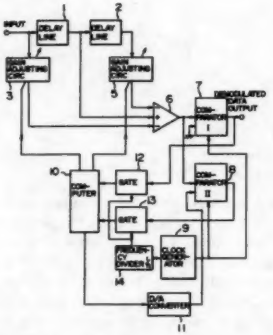
Seiichi Mita, Kanagawa; Morishi Izumita, Inagi; Hiroshi Ide, Kodaira; Nobukazu Doi, Hachioji; Yoshinori Okada, Yokohama, and Yasuo Inagaki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 21, 1989, Ser. No. 454,406

Claims priority, application Japan, Dec. 23, 1988, 63-323294

Int. Cl.[5] H03H *7/30*

U.S. Cl. 375—12 **6 Claims**



1. An automatic equalization apparatus, comprising:

first and second delay lines in cascade connection for delaying an input signal;

a first gain adjusting circuit connected to an input side of said first delay line;

a second gain adjusting circuit connected to an output side of said second delay line;

an adder for adding an output signal of said first delay line and output signals of said first and second gain adjusting circuits;

a first comparator for identifying an output signal of said adder;

a second comparator for detecting an equalization error of the output signal of said adder;

means for controlling said first and second gain adjusting circuits on the basis of the result of identification in said first comparator and the equalization error detected in said second comparator; and,

conversion means for converting a digital signal to an analog signal, wherein the conversion means is interposed between the second comparator and the controlling means.

5,151,925

COHERENT DEMODULATION METHOD FOR A DIGITALLY MODULATED SIGNAL HAVING A CONTINUOUS PHASE AND A CONSTANT ENVELOPE

Benoit Gelin, Bonneuil, and Michel Lebourg, Marcoussis, both of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jun. 22, 1989, Ser. No. 370,214

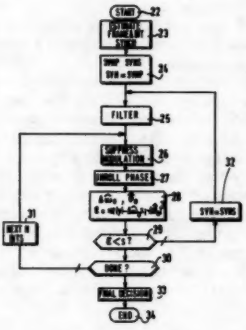
Claims priority, application France, Jun. 28, 1988, 88 08651

Int. Cl.[5] H04L *27/22*

U.S. Cl. 375—82 **16 Claims**

1. Method of coherent demodulation of a digitally modulated received signal having a continuous phase and a constant envelope, a modulated term of the continuous phase being equal to the convolution product of a phase impulse response extending over a plurality of bit periods, and binary information transmitted in packets, each packet having a known preamble of N bits, the received signal being transposed in a baseband over two quadrature channels, converted into a digital signal, and transferred to a digital signal processor which carries out the demodulation method, comprising the steps of:

detecting approximately, the frame-synchronization and the bit-synchronization of a packet by correlating said known preamble of N bits with a differential phase of the received signal;



beginning an estimation of approximate values $\hat{\theta}_0$ and Δf_0 of an initial phase $\hat{\theta}_0$ and residual frequency offset Δf_0, respectively, of the received signal;

progressively refining the approximate values of the initial phase and residual frequency offset by means of two interleaved digital loops: a slow loop for detecting the bit-synchronization, said slow loop being activated when a predetermined threshold value is exceeded by a difference ϵ which is a function of the approximate values θ_0 and Δf_0, and a fast loop for effecting intermediate decisions over additional blocks of bits for extracting decided bits and for estimation of θ_0 and Δf_0, said fast loop being activated following a determination that said predetermined threshold is not exceeded by said difference ϵ.

5,151,926

SAMPLE TIMING AND CARRIER FREQUENCY ESTIMATION CIRCUIT FOR SINE-COSINE DETECTORS

Sandeep Chennakeshu, Clifton Park, and Gary J. Saulnier, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 21, 1991, Ser. No. 703,516

Int. Cl.[5] H04L *27/22*

U.S. Cl. 375—84 **12 Claims**

1. In the receiver of a cellular telephone for receiving phase angles encoded in a received signal, a digital discriminator, said discriminator comprising:

a) heterodyne for converting said received signal to an intermediate frequency (IF) signal;

b) an analog to digital (A/D) converter coupled to sample said IF signal and create a digital output signal comprised of a plurality of samples, each sample comprising a quadrature coefficient and an in-phase coefficient;

b) a sorter circuit coupled to receive the digital output signal and provide a predetermined number of samples for decoding;

c) a sample and phase adjustment (SPA) circuit coupled to receive the samples provided by the sorter circuit and receive a carrier phase adjustment, for creating output samples each having an in-phase coefficient and a quadrature coefficient based upon the carrier phase adjustment

and for selecting samples for decoding based upon a received sample timing index;

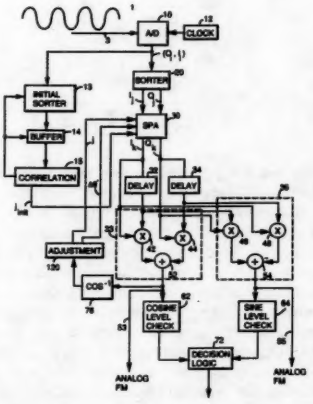
d) a first delay circuit coupled to the SPA circuit, to receive and delay the quadrature coefficient of the output sampels of the SPA circuit for a predetermined period representing a single symbol period, creating a first delayed signal;

d) a second delay circuit coupled to the SPA circuit, to receive and delay the in-phase coefficient of the output samples of the SPA circuit for a predetermined period representing a single symbol period, creating a second delayed signal;

f) a cosine detector coupled to receive the quadrature coefficient, the first delayed signal, the in-phase coefficient and the second delayed signal, for creating an output signal that is a cosine function of a phase angle encoded in the in-phase coefficient and quadrature coefficient;

g) a sine detector coupled to receive the quadrature coefficient, the first delayed signal, the in-phase coefficient and the second delayed signal, for creating an output signal that is a sine function of a phase angle encoded in the in-phase coefficient and quadrature coefficient;

h) a cosine level check circuit coupled to receive the output signal from the cosine detector for producing an output signal based upon the amplitude of the cosine detector output signal;



i) a sine level check circuit coupled to receive the output signal from the sine detector for producing an output signal based upon the amplitude of the sine detector output signal;

j) a decision logic circuit coupled to receive the output signals of the sine level check circuit and the cosine level check circuit and for producing an output signal consisting of pairs of encoded bits based upon the signals received, one bit of each pair being determined by the cosine level check circuit output signal and the other bit of said pair being determined by the sine level check circuit output signal;

k) an inverse trigonometric function circuit coupled to a corresponding trigonometric level check circuit for creating a symbol phase angle; and

l) an adjustment circuit coupled to said inverse trigonometric circuit for calculating a decoding error between the decoded phase angle for each symbol in a preamble and a respective one of a predetermined set of phase angles stored by the adjustment circuit, and for adjusting the sample timing and carrier phase adjustment to minimize the decoding error.

5,151,927

DUAL-MODE SYNCHRONIZATION DEVICE, IN PARTICULAR FOR FRAME CLOCK PHASE RECOVERY IN A HALF-DUPLEX TRANSMISSION SYSTEM

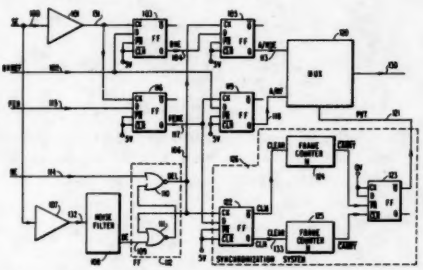
Mark Medlicott, Illkirch, France, assignor to Alcatel Business Systems, Paris, France

Filed Sep. 11, 1990, Ser. No. 580,733

Claims priority, application France, Sep. 12, 1989, 89 11895

Int. Cl.[5] H03D *3/24*; H04J *3/06*

U.S. Cl. 375—119 **6 Claims**



1. A synchronization device, in particular for recovering phase synchronization of a local frame clock of a receiver, in the case of a digital signal formed by frames received at regular intervals, said signal being coded in a code having a detectable line pulse density, which device comprises:

coded signal detection means for detecting the presence of said coded signal at said receiver;

phase locking means delivering an indication of a phase difference between the local clock and the received signal when the presence of said coded signal is detected,

phase reference point detection means for detecting a received frame phase reference point in a time window centered on the phase of the local clock;

phase recovery means supplying an indication of the phase difference between the local clock and the received signal when said received frame phase reference point is detected in said time window centered on the phase of the local clock, and

selecting means for selecting one of the phase difference indications supplied by said phase locking means and said phase recovery means.

5,151,928

METHOD AND APPARATUS FOR GENERATING X RAYS

Hideo Hirose, Wako, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Aug. 20, 1991, Ser. No. 747,332

Claims priority, application Japan, Aug. 31, 1990, 2-231785

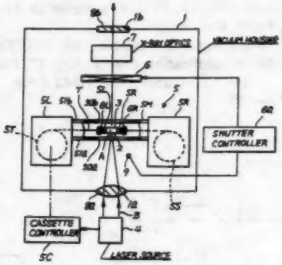
Int. Cl.[5] H01J *35/26*; G21G *4/00*

U.S. Cl. 378—119 **17 Claims**

1. A method of generating X rays, comprising:

a) providing a target in a vacuum enclosure, said target comprising a first film made of a metal and a second film made of a material transparent to X rays superimposed on one surface of said metal film;

b) forming a space between opposite parts of said first and second films; and



c) irradiating said part of said first film which corresponds to said space with a laser beam to generate in said space plasma to emit X rays.

5,151,929

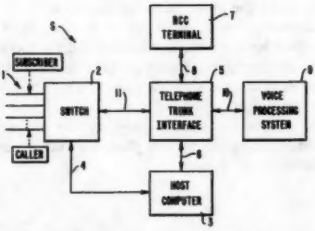
COMPUTER-CONTROLLED RADIO-PAGING AND TELEPHONE COMMUNICATION USING RECORDED VOICE MESSAGES

Sherman Wolf, 369 Boston Post Rd., Amherst, N.H., assignor to Sherman Wolf, Amherst, N.H.

Continuation of Ser. No. 133,214, Dec. 7, 1987, abandoned, which is a continuation of Ser. No. 776,913, Sep. 17, 1985, abandoned. This application Dec. 27, 1989, Ser. No. 457,663

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—57 **7 Claims**



1. A method of providing communication between a remote subscriber of a paging system and a caller to the system, that comprises receiving a call from the caller via telephone trunk line means; obtaining an identification number of a remote subscriber from the caller and verifying the identification number in a host computer; employing the host computer to cause a radio carrier terminal to page the subscriber; and, if the subscriber answers the page by calling the host computer via the telephone trunk line means and providing the subscriber's identification number within a preselected time, thereupon automatically switching the subscriber and the caller into direct telephone connection via the telephone trunk line means under the direction of the host computer, but if the subscriber fails to so answer the page within said preselected time, thereupon, under the control of the host computer, providing a recorded voice message to the caller via the telephone trunk line means indicating that the subscriber has not answered the page, inviting the caller to leave a voice message for the subscriber, and recording the caller's voice message for later retrieval by the subscriber in response to the subscriber's calling the host computer.

5,151,930

METHOD FOR PERSONAL PAGING A TELEPHONE PRIVATE BRANCH EXCHANGE WITH THE ASSISTANCE OF A PERSONAL PAGING DEVICE THAT OFFERS MUTUALLY DIFFERENT OPERATING MODES FOR PERSONAL PAGING

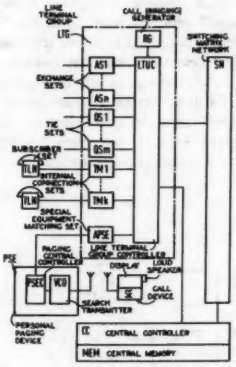
Ernst Hagl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 21, 1990, Ser. No. 586,209

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1989, 3931533

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—57 **2 Claims**



1. A method for personal paging in a telephone private branch exchange comprising a central controller, a central memory, a personal paging device for selective communication with a plurality of call devices each assigned to a respective person to be paged, a plurality of external connection sets for connecting calls external of the telephone private branch exchange and a plurality of internal connection sets connected to subscriber telephone instruments of the telephone private branch exchange; the personal paging device, in a predetermined operating mode of the type wherein calls originating in the telephone private branch exchange from one of the telephone instruments cause call information including the subscriber line number of the calling subscriber to be communicated to the personal paging device from the central controller, hence in addition to a call signalization the line number of the calling subscriber is reproduced; at the call device in the case in which a calling subscriber is external of the private branch exchange and the line number of the calling subscriber is absent, the method for personal paging comprising the steps of:

generating a calling line identifier information in the central controller;

communicating said identifier information from the central controller to the personal paging device and reproducing said identifier information of the signaled call device;

storing data in the central memory for designating the external connection set of the calling subscriber and the subscriber line of the called subscriber in allocation thereto;

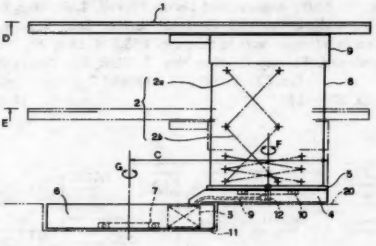
transmitting an acknowledgment to the external connection set of the calling subscriber to indicate to the calling subscriber that the exchange has received the page requested and to hold the line; and

receiving the identifier information from an arbitrary subscriber telephone instrument causing the central controller to connect the internal connection set of the arbitrary subscriber telephone instrument to the external connection set of the calling subscriber.

5,151,931
THERAPEUTIC BED OF RADIOTHERAPEUTIC SYSTEM

Kozo Terashi, and Toshio Oba, both of Otawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 21, 1991, Ser. No. 718,758
Claims priority, application Japan, Jun. 21, 1990, 2-161208
Int. Cl.[5] A61N *5/10*
U.S. Cl. 378—65 **4 Claims**



1. A therapeutic bed of a radiotherapeutic system including a radioactive ray irradiator in which a radioactive ray irradiating source is disposed to one position on a side of a back of a living human body to be inspected and which radiates radioactive rays for treatment of an effected portion of a living human body, comprising:

a top board on which the living human body to be inspected is to be laid,

a support base rotatably mounted on a floor of a therapeutic room in which the therapeutic bed is disposed;

an elevating mechanism supported by the support base and supporting the top board for vertical elevation, said elevating mechanism comprising a hydraulic link mechanism;

a vertically expandable and contractible casing covering the elevating mechanism so as to be vertically contractible and expandable in association with a vertical motion of the elevation mechanism; and

a hydraulic means for driving the elevating mechanism, said hydraulic driving means being embedded in the floor of the therapeutic room.

5,151,932
METHOD AND SYSTEM FOR SELECTIVELY COMMUNICATING WITH A TELEPHONE OR A NON-TELEPHONE TERMINAL THROUGH A PUBLIC TELEPHONE NETWORK

Masato Arizumi; Norio Ozawa; Yasuo Haruta, and Yoshinobu Mabuchi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 382,066, Jul. 14, 1989, abandoned. This application May 6, 1991, Ser. No. 694,979
Claims priority, application Japan, Nov. 17, 1987, 62-290084; Nov. 17, 1987, 62-290085
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—106 **21 Claims**

1. A communication system, comprising:

a telephone network for switching a plurality of telephone lines;

a telephone accessible to the telephone network;

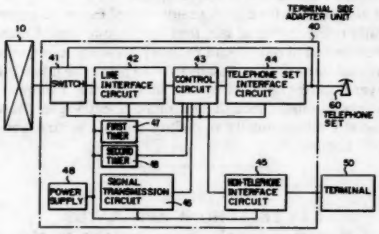
a non-telephone terminal for performing data communication via the telephone network;

first control means, connected to a first telephone line of the plurality of telephone lines, for controlling the connection of the telephone and the non-telephone terminal to the telephone network, the first control means including timer means for monitoring predetermined time zones and for measuring first and second predetermined time periods;

center apparatus means for supervising data communication with the non-telephone terminal; and

second control means, connected to a second telephone line of the plurality of telephone lines, for controlling the connection of the center apparatus means to the telephone network, the second control means including means for initiating a predetermined sequence of calls to the first control means via the telephone network in response to the center apparatus means, and means for interrupting each call after receiving a respective ring back signal from the telephone network to restore the lines,

wherein the first control means additionally includes means for determining whether a ringing signal for a call is received within a time zone and interrupted within the first time period, means for determining whether a call is received in the predetermined sequence, and means for calling the second control means if the first control means receives a plurality of calls in the predetermined sequence and each of the plurality of calls in the predetermined sequence was received during a respective time zone and interrupted within the first time period, and

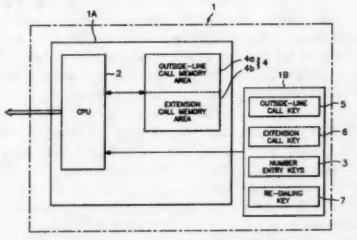


wherein the first control means additionally includes means for connecting the first telephone line to the non-telephone terminal if the first control means receives an answer signal from the second control means in response to the call from the first control means within the second time period.

5,151,933
KEY TELEPHONE SYSTEM

Kazuyuki Abe, Yokohama, Japan, assignor to Nitsuko Corporation, Kawasaki, Japan

Filed Aug. 14, 1991, Ser. No. 744,503
Claims priority, application Japan, Aug. 16, 1990, 2-216758
Int. Cl.[5] H04M *1/272*
U.S. Cl. 379—159 **3 Claims**



1. A key telephone system with a re-dialing feature, which has number entry push-buttons for dialing a telephone number of an intended call, comprising:

control means for controlling said key telephone system so as to place a call to a location having a number dialed through said number entry push-buttons;

a memory, having two separate telephone number memory

areas for memorizing both a first dialed number for placing an intended outside-line call and a second dialed number for placing a call to an intended extension through said control means so as to replace dialed numbers for placing previous calls, memorized in said memory areas, with said first and second dialed numbers;

line selecting means for selecting one or an outside-line and an inside-line, and causing said control means to gain access to the outside-line to place said intended outside-line call and select said memory area for memorizing said first dialed number when an outside-line is selected, and causing said control means to gain access to the inside-line to place said call to said intended extension and select said memory area for memorizing said second dialed number when an inside-line is selected; and

re-dialing means for causing said control means to automatically retrieve one of said first and second dialed numbers memorized in one of said memory areas for a line selected by said line selecting means so as to place the intended call over said line selected by said line selecting means to said number dialed through said number entry push-buttons, thereby automatically re-dialing one of the first and second numbers.

5,151,934

KEY TELEPHONE APPARATUS

Takashi Hayashi, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

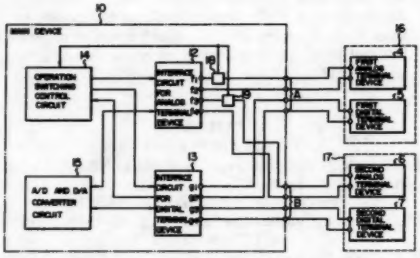
PCT No. PCT/JP91/00095, § 371 Date Sep. 13, 1991, § 102(e) Date Sep. 13, 1991, PCT Pub. No. WO91/11888, PCT Pub. Date Aug. 8, 1991

PCT Filed Jan. 29, 1991, Ser. No. 761,853

Claims priority, application Japan, Jan. 30, 1990, 2-019516

Int. Cl.[5] H04M *9/00*

U.S. Cl. 379—159 **1 Claim**



1. A key telephone apparatus comprising:

an interface circuit for analog terminal device including four terminals associated with two pairs having four wires;

an interface circuit for digital terminal device including four terminals associated with two pairs having four wires;

a first analog terminal device connected to two terminals of said interface circuit for analog terminal device, said two terminals being associated with one pair having two wires;

a second analog terminal device connected to two remaining terminals of said interface circuit for analog terminal device, said two remaining terminals being associated with remaining one pair having two wires;

a first digital terminal device connected to two terminals of said interface circuit for digital terminal device, said two terminals being associated with one pair having two wires;

a second digital terminal device connected to two remaining terminals of said interface circuit for digital terminal device, said two remaining terminals being associated with remaining one pair having two wires; and

switching control means for handling the first analog terminal device and the first digital terminal device as a first hybrid terminal device sharing one port and handling the second analog terminal device and the second digital terminal device as a second hybrid terminal device sharing another port.

5,151,935

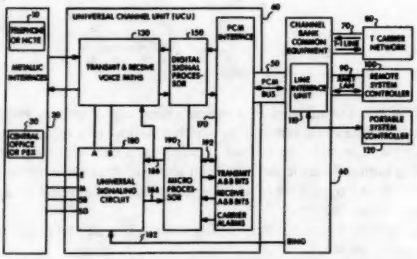
PROGRAMMABLE UNIVERSAL SIGNALING CIRCUIT FOR A TELEPHONE NETWORK

Jimmy D. Slife, Aurora, and David Farrell, Lafayette, both of Colo., assignors to XEL Communications, Inc., Aurora, Colo.

Continuation-in-part of Ser. No. 453,814, Dec. 20, 1989, abandoned. This application Nov. 2, 1990, Ser. No. 609,083

Int. Cl.[5] H04J *3/12*; H04M *7/10*

U.S. Cl. 379—240 **11 Claims**



1. A programmable universal signaling circuit (180) for use in a universal channel unit (40) of a telephone network; said universal channel unit having: A, B, E, M SB, and SG telephone network signaling paths, a microprocessor (190) and a PCM interface (170); said PCM interface being connected to a PCM bus (50), said programmable universal signaling circuit comprising:

means (200) connected to said microprocessor and receptive of data from said microprocessor for generating a unique set of configuration signals corresponding to said received data, said generating means further generating a plurality of different sets of configuration signals corresponding to a plurality of different data received from said microprocessor,

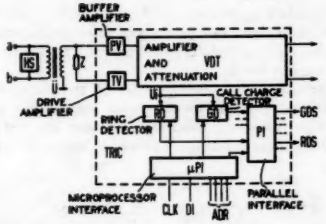
first means (210) connected to said generating means, to said microprocessor, and to said A and B signaling paths for selectively configuring to function as a preselected one of a number of loop circuits, said first generating means being receptive of a first portion of said unique set of configuration signals to configure into said preselected one of said number of loop circuits so as to provide A and B signals over said A and B signaling paths necessary for said preselected one loop circuit, said first configuring means delivering the sensed loop current value or loop voltage value for said A and B signaling paths to said microprocessor, and

second means (220) connected to said generating means, to said microprocessor, and to said E, M, SG, and SB signaling paths for selectively configuring to function as a preselected one of a number of E & M circuits, said second configuring means being receptive of a second portion of said unique set of configuration signals to configure into said preselected one of said number of E & M circuits so as to provide E, M, SB, and SG signals over said E, M, SB and SG signaling paths necessary for said selected one E & M circuit, said second configuring means further delivering the sensed E & M current value or E & M voltage value for said E & M signaling paths to said microprocessor.

5,151,936
INTERFACE MEANS

Ulrich Riedle, Feldkirchen-Westerham, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich

Filed May 29, 1990, Ser. No. 529,613
Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917713
Int. Cl.[5] H04M *9/00*
U.S. Cl. 379—403 **14 Claims**

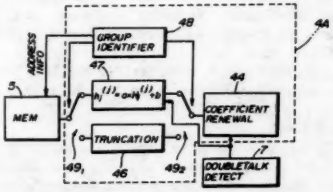


1. Interface means having amplification and attenuation elements as well as different signalization detectors between a bidirectional transmission channel with analog signals and a signal processor-codec filter having a four-wire input for matching line signalization voltages to the interface messages of a digital communication system, the amplification and attenuation elements for a voice signal arranged in a four-wire circuit, a transformer for connecting the bidirectional transmission channel to the interface means being an attenuation element in a lower frequency range and a transmission and terminating complex impedance connected to the interface means and selected such that all signalization voltages are transformed into a range that can be interpreted by a 10 V technology system, the signalization voltages taken following the complex impedance, and, for suppressing higher-frequency noise signals, the signalization voltages supplied via a low-pass filter to a ringing signal detector or, respectively, via at least one selective band-pass filter to a call charge signal detector.

5,151,937
ADAPTIVE ECHO CANCELLER

Kaoru Chujo, Hachiouji; Mitsuo Kakuishi, and Hirokazu Fukui, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 12, 1990, Ser. No. 551,485
Claims priority, application Japan, Jul. 12, 1989, 1-180984
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—410 **15 Claims**



1. An adaptive echo canceller for suppressing an echo in an input signal by a pseudo echo, said adaptive echo canceller comprising:

a pseudo echo generation filter having a predicted impulse response sequence of an echo path as filter coefficients thereof for generating a pseudo echo;

coefficient renewal means for adaptively renewing the filter coefficients of said pseudo echo generation filter to produce renewed filter coefficients, said coefficient renewal means including

means for dividing the renewed filter coefficients into a plurality of groups each having a certain number of renewed filter coefficients, and

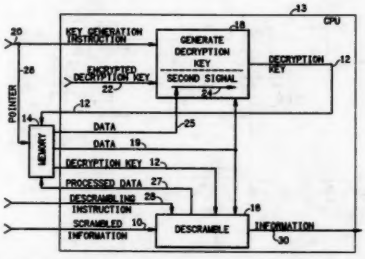
means for successively selecting one group with a predetermined period and carrying to a correction process with respect to the renewed filter coefficients within the selected group, the correction process correcting an accumulation of errors of renewal processes; and

means for suppressing an echo by the pseudo echo generated by said pseudo echo generation filter.

5,151,938
SECURITY ENHANCEMENT IN A DATA PROCESSOR THROUGH USE OF DYNAMIC PARAMETER AUTHENTICATION

Roy A. Griffin, III, Oceanside; James N. Esserman, San Diego, and Steven E. Anderson, La Jolla, all of Calif., assignors to General Instrument Corporation, Chicago, Ill.

Filed Mar. 13, 1990, Ser. No. 493,006
Int. Cl.[5] H04L *9/00*
U.S. Cl. 380—43 **23 Claims**



1. A data processing system, comprising

processing means for processing data in accordance with a number of different data processing routines; and

memory means for storing data for use in said data processing routines;

wherein the processing means includes

means for responding to an instruction for generating a given signal by processing a first signal with a second signal to generate said given signal; and

means for providing at least a portion of said second signal for processing with said first signal by retrieving a portion of said stored data from a portion of said memory means identified by a dynamic pointer contained in said instruction for generating said predetermined signal;

wherein the given signal has a predetermined content that is essential to at least one of said data processing routines.

5,151,939
ADAPTIVE AUDIO PROCESSOR FOR AM STEREO SIGNALS

Jeffrey J. Marrah; Gregory J. Manlove, both of Kokomo; Rickard A. Kennedy, Russiaville, and Mark A. Kady, Sharpsville, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Mar. 21, 1990, Ser. No. 496,711
Int. Cl.[5] H04H *5/00*
U.S. Cl. 381—15 **14 Claims**

1. A signal processing system comprising:

means for receiving signals in a prescribed frequency band including a first signal and interference from frequencies adjacent the prescribed frequency band;

means responsive to the received signals for adjustably limiting the prescribed frequency band of the received signals

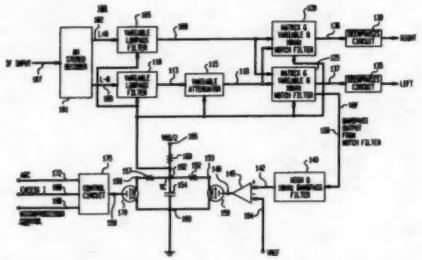
to produce a output signal representative of the first signal;

means responsive to the interference from frequencies adjacent to the prescribed frequency band for producing a band adjustment signal;

means responsive to the band adjustment signal for adjusting the prescribed frequency band to reduce the interference in the output signal;

said means for producing the band adjustment signal comprising means responsive to the interference from the frequencies adjacent to the prescribed frequency band for forming an interference representative signal, means for generating a predetermined threshold signal, means for detecting the difference between the interference representative signal and the predetermined threshold, and means responsive to the detected difference for producing the band adjustment signal;

said means for forming the interference representative signal comprising means for forming a narrow frequency band signal centered at the edge of the prescribed frequency band;



said predetermined threshold signal generating means comprising means for producing a prescribed voltage;

said difference detecting means comprising means for producing a difference detecting means comprising means for producing a difference representative signal having a first value when the interference representative signal exceeds the prescribed voltage and a second value when the interference representative signal is less than or equal to the prescribed voltage;

said difference detecting means further comprising means responsive to the difference representative signal for forming a continuously varying band adjustment signal;

said narrow band difference signal being a narrow band sine wave like signal representative of the interference from the frequencies adjacent to the prescribed frequency band; and

said difference detecting means further comprising means for comparing the narrow band sine wave like signal to the prescribed threshold voltage to produce a pulse having a prescribed voltage when the narrow band sine wave like signal exceeds the prescribed threshold voltage.

5,151,940

METHOD AND APPARATUS FOR EXTRACTING ISOLATED SPEECH WORD

Makoto Okazaki, Higashimurayama, and Koji Eto, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 287,284, Dec. 21, 1988, abandoned. This application Dec. 7, 1990, Ser. No. 622,285

Claims priority, application Japan, Dec. 24, 1987, 62-333852

Int. Cl.[5] G10L *5/00*

U.S. Cl. 381—43 **10 Claims**

1. A method for extracting an isolated speech word, having a starting point and a finishing point, from an input speech signal, said method comprising the steps of:

(a) dividing the input speech signal into a high frequency band signal within a high frequency band and a low frequency band signal within a low frequency band, including the substeps of:

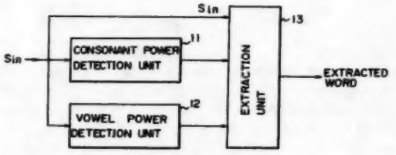
i) obtaining the high frequency band signal from a consonant of the input speech signal; and

ii) obtaining the low frequency band signal from a vowel of the input speech signal;

iii) calculating an average high frequency band signal power of signal components of the high frequency band signal having predetermined frequencies within the high frequency band;

iv) calculating an average low frequency band signal power of signal components of the low frequency band signal having predetermined frequencies within the low frequency band;

(d) determining the starting point of the isolated speech word from the input speech signal when one of the average high frequency band signal power and the average low frequency band signal power is higher than first and



second predetermined threshold levels, respectively, including the substeps of:

i) comparing the average high frequency band signal power with the first threshold level;

ii) comparing the average low frequency band signal power with the second threshold level;

iii) detecting whether one of a first state and a second state is maintained for a predetermined term, in the first state the average high frequency band signal power is higher than the first threshold level and in the second state the average low frequency band signal power is higher than the second threshold level; and

iv) identifying a starting point of the isolated speech word where one of the first and second states begins; and

(e) determining the finishing point of the isolated speech word from the input speech signal when one of the average high frequency band signal power and the average low frequency band signal power is lower than third and fourth predetermined threshold levels, respectively.

5,151,941

DIGITAL SIGNAL ENCODING APPARATUS

Masayuki Nishiguchi; Yoshihito Fujiwara, and Tomoko Umezawa, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 7, 1990, Ser. No. 588,715

Claims priority, application Japan, Sep. 30, 1989, 1-255798

Int. Cl.[5] G10L *3/00, 5/00, 7/02*

U.S. Cl. 381—46 **6 Claims**

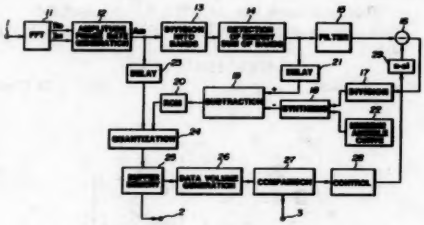
1. A digital signal encoding apparatus comprising

noise level setting means for dividing input digital signals into a plurality of frequency bands so that the bandwidth of each frequency band is broader as the frequency of the frequency bands increases, said noise level setting means setting the allowable noise level of each of the plurality of frequency bands on the basis of the energy of each said frequency band,

quantization means for quantizing components of each frequency band with a number of bits consistent with the level difference between the energy of each frequency band and that of the output of said noise level setting means, and

means for detecting the number of bits allocated to the

output information of said quantization means and for adjusting the number of bits of the output information



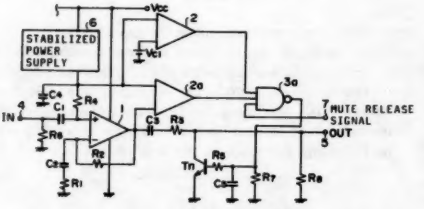
over a predetermined time interval to be constant as a function of the detection output.

5,151,942

CIRCUIT FOR MUTING NOISES FOR AN AUDIO AMPLIFIER

Yoshio Sasaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 29, 1991, Ser. No. 706,696
Claims priority, application Japan, Oct. 25, 1990, 2-287990
Int. Cl.[5] H04B *15/00*
U.S. Cl. 381—94 **3 Claims**



1. A circuit for muting noises for an audio amplifier circuit having an output terminal comprising:

an amplifier for amplifying an input signal;

a stabilized power supply for supplying a constant voltage to the amplifier;

a first comparator for comparing an output voltage of the stabilized power supply with a reference value and for producing a first comparator signal when the output voltage coincides with the reference value;

a second comparator for comparing an output bias voltage of the amplifier with the output voltage of the stabilized power supply and for producing a second comparator signal when the output bias voltage coincides with the output voltage;

gate means responsive to the first and second comparator signals and to a mute release signal for producing a mute release control signal, and for producing a mute control signal when either of the first or second comparator signals or the mute release signal is not applied; and

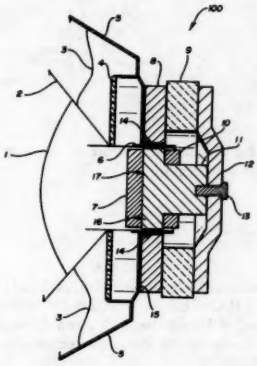
a grounding circuit responsive to the mute control signal for grounding the output of the amplifier to attenuate an output to be produced from the output and responsive to the mute release control signal for cutting the grounding of the output of the amplifier.

5,151,943

LOW DISTORTION DYNAMIC LOUDSPEAKER

Carl Van Gelder, Tioga Center, N.Y., assignor to McIntosh Laboratory, Inc., Binghamton, N.Y.

Filed Nov. 13, 1990, Ser. No. 611,552
Int. Cl.[5] H04R *25/00*
U.S. Cl. 381—189 **14 Claims**



1. A dynamic loudspeaker distinguished by increased power output with decreased distortion, said dynamic loudspeaker having a cone movably supported within a basket, said basket supported upon a front plate, a back plate disposed behind said front plate, an annular magnet disposed between said front plate and said back plate, a cylindrical stepped pole piece disposed within said annular magnet and supported by said back plate, said cylindrical stepped pole piece comprising a first cylinder disposed adjacent said back plate, and a second, wider cylinder integrally disposed upon said first cylinder, the outer surface of said second, wider cylinder forming an air gap with said front plate, across which a magnetic flux is created, a voice coil disposed within said air gap between said cylindrical stepped pole piece and said front plate, and first and second, spaced-apart shield members, each comprising tube-like members, each of which is disposed adjacent said cylindrical stepped pole piece on distal sides thereof, said first shield member disposed between said cylindrical stepped pole piece and said cone, and said second shield member disposed between said cylindrical stepped pole piece and said annular magnet, said first and second shield members shielding said cylindrical stepped pole piece from magnetic flux interactions created in said air gap and reducing non-symmetrical voice coil inductances, whereby said dynamic loudspeaker has increased power output with decreased distortion.

5,151,944

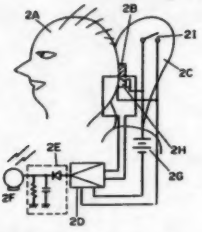
HEADREST AND MOBILE BODY EQUIPPED WITH SAME

Souhei Yamamura, Takarazuka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP89/00958, § 371 Date May 15, 1990, § 102(e) Date May 15, 1990, PCT Pub. No. WO90/03136, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 21, 1989, Ser. No. 460,334
Claims priority, application Japan, Sep. 21, 1988, 63-236916
Int. Cl.[5] H04R *3/00*
U.S. Cl. 381—151 **9 Claims**

1. A headrest comprising a bone-condition microphone mounted thereon in a position so as to be in contact with a back side of the head of the operator during use and a power switch mounted on said headrest adjacent said bone-conduction microphone, said switch having a contact which is turned on

substantially simultaneously with positive pressing of the bone-conduction microphone, such that said switch detects contact



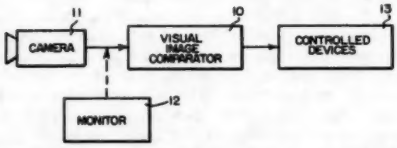
between the back side of the head of the operator and said bone-conduction microphone.

5,151,945

DETERMINATION OF AMBIENT LIGHT LEVEL CHANGES IN VISUAL IMAGES

George C. Lee, Williamsville, N.Y., and Xianyi Sun, Beijing, Taiwan, assignors to The Research Foundation of State Univ. of N.Y., Albany, N.Y.

Filed Sep. 11, 1990, Ser. No. 580,629
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—1 3 Claims
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 21 Pages)



1. A visual image comparison method for automated video surveillance, comprising the steps of:

a. obtaining a first digital representation of a first visual image, said first digital representation comprising a first plurality of pixels, wherein each pixel has a gray scale indicative of light intensity;

b. obtaining a second digital representation of a second visual image, said second digital representation comprising a second plurality of pixels, wherein each pixel has a gray scale indicative of light intensity;

c. selectively making a first predetermined number of first comparisons of corresponding remotely displaced pixels from said first and second digital representations to determine whether a difference in ambient light intensity exists between said first and second visual images, wherein said difference in ambient light intensity is defined to exist when a first percentage of said first predetermined number of first remotely displaced comparisons result in pixels having a difference in gray scale of a first predetermined amount; and,

d. selectively making a second predetermined number of second comparisons of corresponding near neighboring pixels from said first and second digital representations if and only if no significant difference in ambient light intensity exists between said first and second visual images,

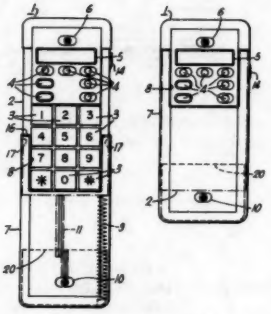
e. and indicating an alarm condition when a second percentage of said second predetermined number of second near neighboring comparisons result in pixels having a difference in gray scale of a second predetermined amount.

5,151,946

VARIABLE CONFIGURATION PORTABLE TELEPHONE

Nils E. Martensson, Woking, England, assignor to Technophone Limited, Surrey, England

Continuation of Ser. No. 568,349, Aug. 15, 1990, abandoned.
This application Feb. 24, 1992, Ser. No. 841,264
Claims priority, application United Kingdom, Aug. 24, 1989, 8919215
Int. Cl.[5] H04M 11/00
U.S. Cl. 379—38 28 Claims



1. A portable radio telephone comprising:

transceiver means,

a housing enclosing said transceiver means, said housing having a main body and an extending portion mounted for longitudinal slidable movement between a first position at which the main body and the extending portion are in a substantial overlapping relationship and a second position at which the extending portion extends from the main body,

first transducer means present in the main body;

second transducer means present in the extending portion;

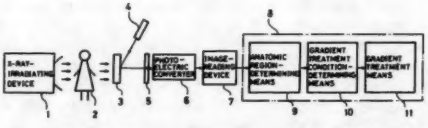
and a keypad which comprises a plurality of keys which can be selectively actuated for operating the telephone, wherein the extending portion comprises a window through which at least one of the keys is accessible when the extending portion is in the first position.

5,151,947

METHOD AND APPARATUS FOR PROCESSING RADIATION IMAGE

Sumiya Nagatsuka; Hiroshi Takeuchi, and Haruo Karasawa, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 26, 1990, Ser. No. 617,602
Claims priority, application Japan, Nov. 28, 1989, 1-306462; Oct. 17, 1990, 2-276484
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—6 6 Claims



1. A method of processing an image, comprising the steps of:

limiting an area of the image from which to obtain a gradation processing condition;

determining the gradation processing condition of the limited area; and

processing the gradation of the image based upon the condition determined by the determining means,

wherein the step of limiting an area of the image from which to obtain a gradation processing condition, where the image extends in lateral and longitudinal directions, comprises the sub-steps of:

obtaining projection values in the longitudinal direction for at least the central portion of the image, each projection value being the cumulative image density along a respective line oriented in the specified direction;

determining a longitudinal median location P_c of one of the projection values having the least cumulative image density in the central one third of the image, said central one third being measured in the lateral direction;

establishing a longitudinally oriented line passing through the median location P_c as a longitudinal median line;

comparing projection values on each side of the longitudinal line with a respective threshold projection value;

establishing a respective right and left boundary, responsive to the comparison, for each side within which said gradation processing condition is determined;

obtaining projection values in the lateral direction;

establishing a lateral median line at the midpoint of the image, said midpoint measured along a longitudinally oriented line;

identifying the minimum lateral projection value P_{bn} below the lateral median line and the minimum lateral projection value above the lateral median line P_{tn};

identifying the maximum lateral projection value P_{tx} within the $\frac{1}{4}$ of the image above the lateral median line, as measured along the longitudinally oriented line, and the maximum lateral projection value P_{bx} within the 3/10 of the image below the median line, as measured along the longitudinally oriented line;

comparing the projection values on each side of the lateral median line with a respective threshold value, wherein the upper threshold value T_t and lower threshold value T_b are determined using the following formulas:

$$T_t=((k3-1)\times P_{tx}+P_{tn})/k3, \text{ and}$$

$$T_b=((k4-1)\times P_{bx}+P_{bn})/k4,$$

where k3 and k4 are constants; and

establishing a respective upper and lower boundary, responsive to the comparison, within which said gradation processing condition is determined.

5,151,948

SYSTEM AND METHOD FOR PROCESSING DOCUMENTS HAVING AMOUNTS RECORDED THEREON

David G. Lyke, and Mark Ominsky, both of Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 492,461, Mar. 12, 1990, Pat. No. 5,040,227. This application Apr. 29, 1991, Ser. No. 693,320

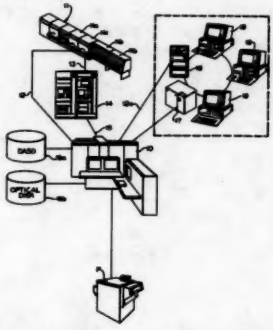
Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—7 **44 Claims**

1. A method of processing documents in groups which include a summary document, such as a customer deposit slip, and a plurality of associated transaction documents, such as checks, with each transaction document having an amount recorded thereon from which a coded data amount is derived, and with the summary document containing a listing of the respective transaction amounts, said method comprising the steps of:

generating on a display screen a first display containing images of a series of transaction amounts listed on a summary document;

also generating on the display screen concurrently with the first display a second display containing coded data amounts associated with each individual transaction document so that an operator may compare the transaction amount images in said first display to the corresponding transaction coded data amounts in said second display to identify a discrepancy;



receiving input by an operator of an identified discrepancy; and

responding to the thus input operator indication of an identified discrepancy.

5,151,949

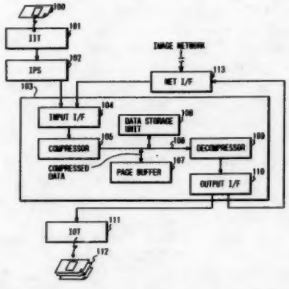
SYSTEM AND METHOD EMPLOYING MULTIPLE PREDICTOR SETS TO COMPRESS IMAGE DATA HAVING DIFFERENT PORTIONS

Masahiko Miyata, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1990, Ser. No. 594,130

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—9 **8 Claims**



1. A processor-implemented method of predicting a series of input pixels comprising the steps of:

determining, in accordance with a bit pattern of a current pixel, whether the current pixel is a first type or a second type;

detecting, in response to the determining step, whether the current pixel type is different than the pixel type of a preceding pixel;

inserting, in response to the detecting step, a boundary code into the pixel series before the current pixel if the pixel type of the current pixel is different than the pixel type of the preceding pixel;

selecting one set of predictors from a plurality of sets of predictors including the substep of detecting a boundary code;

processing the previous pixel with multiple predictors in the selected set of predictors; and

selecting one of the predictors in the selected set of predic-

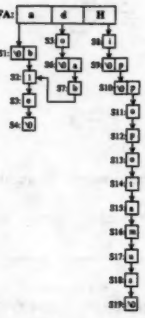
tors in accordance with a number of error bits generated by processing the previous pixel.

5,151,950

METHOD FOR RECOGNIZING HANDWRITTEN CHARACTERS USING SHAPE AND CONTEXT ANALYSIS

Gregory N. Hullender, Foster City, Calif., assignor to Go Corporation, Foster City, Calif.

Filed Oct. 31, 1990, Ser. No. 607,125
Int. Cl.[5] G06K *9/00, 9/62, 9/72, 9/46*
U.S. Cl. 382—13 **13 Claims**



5. A method for recognition of sequences of characters, including the steps of:

(1) storing a plurality of input strokes which are in a sequence;

(2) generating a first set of recognition hypotheses for a first subset of said strokes, beginning at one end of the sequence of strokes, each hypothesis including: (i) a hypothesized character, (ii) the number of strokes required to construct the hypothesized character, and (iii) a probability assigned to the hypothesized character;

(3) comparing each hypothesized character with a predetermined database of character sequences;

(4) for each hypothesized character which is found as a first character in the predetermined database of character sequences, generating a pointer which is correlated with that hypothesis and which points to that character's position in the database;

(5) for each character which is not found as a first character in the predetermined database of character sequences, assigning a lower probability to that character's recognition hypothesis;

(6) designating the recognition hypothesis having the highest probability as the current active hypothesis in the set of recognition hypotheses of which that recognition hypothesis is a member;

(7) placing that set of recognition hypotheses as the first element on a stack of sets of recognition hypotheses;

(8) from a plurality of strokes following the last stroke which is a part of the current active hypothesis from the set of recognition hypotheses at the top of the stack, generating a new set of new recognition hypotheses, each said new recognition hypothesis including: (i) a hypothesized character, (ii) the number of strokes required to construct the hypothesized character, and (iii) a probability assigned to the hypothesized character;

(9) replacing the probability assigned to each new recognition hypothesis with a value derived from the current value of the probability for the new recognition hypothesis and the value of the probability of the current active hypothesis from the set of recognition hypotheses at the top of the stack;

(10) if the current active hypothesis from the set of recognition hypotheses at the top of the stack has an assigned pointer to the database, then for each new hypothesis which is found in the predetermined database of character sequences as a new character following the character corresponding to said current active hypothesis, generating a pointer which is correlated with that hypothesis and which points to the new character's position in the database;

(11) if the current active hypothesis from the set of the recognition hypotheses at the top of the stack does not have an assigned pointer to the database, then for each new hypothesis, reduce the probability of every recognition hypotheses in the new set by a predetermined factor;

(12) designating the recognition hypothesis which is a member of the new set of recognition hypotheses and which has the highest probability in that set as the current active hypothesis in that set;

(13) placing the new set of recognition hypotheses on top of the stack;

(14) repeating steps 8 through 13, until no additional strokes are found in step 8 following the last stroke which is a part of the current active hypothesis from the set of recognition hypotheses at the top of the stack;

(15) generating a first hypothesis string from the current active hypothesis of each set of recognition of hypotheses, in order from the bottom of the stack to the top;

(16) generating a probability for the first hypothesis string, based upon the value of the probability for the current active hypothesis from the set of recognition hypotheses at the top of the stack;

(17) storing the first hypothesis string as the best hypothesis string and storing its probability as the best probability, and proceeding to step 20;

(18) generating a new hypothesis string from the current active hypothesis of each set of recognition of hypotheses, in order from the bottom of the stack to the top;

(19) generating a probability for the new hypothesis string, based upon the value of the probability for the current active hypothesis from the set of recognition hypotheses at the top of the stack;

(20) if the probability of the new hypothesis string is higher than the stored best probability, storing the new hypothesis string as the best probability string and storing its probability as the best probability;

(21) if the set of recognition hypotheses at the top of the stack includes a subset of at least one other recognition hypothesis having a probability lower than the current active hypothesis, then designating the recognition hypothesis of said subset which has the highest probability value as the current active hypothesis and repeating steps 8–14 and 18–20;

(22) removing the set of recognition hypotheses at the top of the stack, and if the stack is not empty as a result of such removal, proceeding to step 21, but if it is empty then proceeding to step 23; and

(23) outputting the best stored string.

5,151,951

CHARACTER RECOGNITION DEVICE WHICH DIVIDES A SINGLE CHARACTER REGION INTO SUBREGIONS TO OBTAIN A CHARACTER CODE

Toru Ueda, Nara; Yasushi Ishizuka, Yamatokooriyama, both of Japan; Fumio Togawa, and Takashi Aramaki, both of Hillsboro, Oreg., assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1991, Ser. No. 667,340
Claims priority, application Japan, Mar. 15, 1990, 2-65055; Mar. 20, 1990, 2-70345
Int. Cl.[5] G06K *9/46*
U.S. Cl. 382—19 **4 Claims**

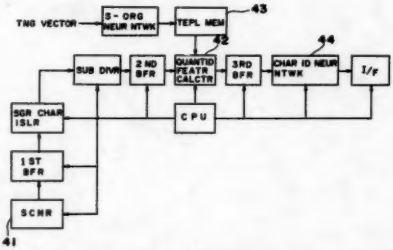
1. A character recognition device which isolates the image data for a single character area from scanned character image data, and recognizes a character code corresponding to the

character image data based on the image data of this single character area, comprising:

a region divider which divides the image data of the single character area into plural subregions,

a features calculator which calculates quantified features of each subregion based on degrees of resemblance between image data of each subregion divided by said region divider and templates which express in each subregion differences in shape of characters in a recognition character group,

a character code recognition means which recognizes the character code corresponding to the scanned character image data based on the quantified features calculated by the features calculator in all subregions composing the single character area, and



a neural network which during training refreshes contents of a specified weight vector corresponding to an input training vector to approach the contents of the input training vector, and which

trains the neural network using training vectors generated for each subregion based on character image data of plural training characters representative of the recognition character group, and

defines as the templates used during calculation of the quantified features of the subregions by the feature calculator the weight vectors set, as a result of being refreshed to approach the contents of each training vector, to express differences in shapes of characters in each of training characters representative of the recognition character group.

5,151,952

CHARACTER RECOGNITION APPARATUS WHICH OBTAINS DISTANCE RATIOS BETWEEN EDGES IN A CHARACTER FOR IDENTIFICATION

Jean Pierre Canu, Yvetot; Bernard DesForges, Darhetal, and Gerard Huette, Rouen, all of France, assignors to Unisys Corp., Blue Bell, Pa.

Filed Jun. 14, 1991, Ser. No. 689,072
Int. Cl.[5] G06K 9/46
U.S. Cl. 382—29 **8 Claims**

1. An apparatus for identifying a predetermined font character moving relative to a scanning head from among a predetermined set of characters, said apparatus comprising:

edge detector means for scanning the character and providing a single analog output signal indicative of the position of the leading and trailing edges in the scanned character;

controller means operative to measure a first distance between the first leading edge and a first selected edge in the scanned character,

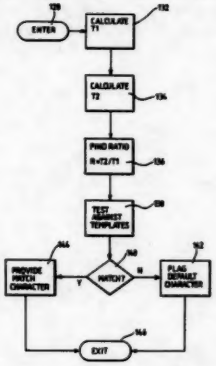
also being operative to measure a second distance between the first leading edge and a second selected edge in the scanned character,

controller means operative to measure a first distance between the first leading edge and a first selected edge in the scanned character,

also being operative to measure a second distance between the first leading edge and a second selected edge in the scanned character,

and operative to take the ratio between said first and second distance to create a novel character ratio;

said controller means comprising a stored set of character signals each representative of the expected ratio for a



respective one of the characters in said predetermined set of characters;

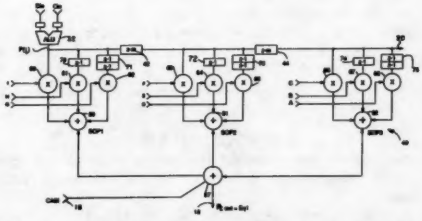
said controller means being operative to compare the character ratio with each character signal and to provide an indication of the character, from said set, with whose character signals the character ratio matches.

5,151,953

SINGLE CHIP 2-D CONVOLVER

David S. Landeta, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Dec. 10, 1990, Ser. No. 624,964
Int. Cl.[5] G06K 9/64
U.S. Cl. 382—41 **35 Claims**



1. A system for Q×R kernel convolution of an M×N array of words, where Q×R is a subset of M×N comprising:

input means for receiving, in sequence, words P from said M×N array;

coefficient means for storing coefficients C_1 through $C_{Q\times R}$;

Q×R matrix of multiplying means, each multiplying means having a first input receiving Pi and a second input receiving a dedicated Cj for producing a product PiCj where i varies from 1 to M×N and j is one of 1 to Q×R;

said first input of each of said multiplying means is connected to a first input of a preceding multiplying means in its respective row of a one stage buffer means;

said first input of a first multiplying means in each row is connected to a first input of a last multiplying means of a previous row by a row buffer means having M−R+1 stages; and

adder means connected to said Q×R matrix of multiplying

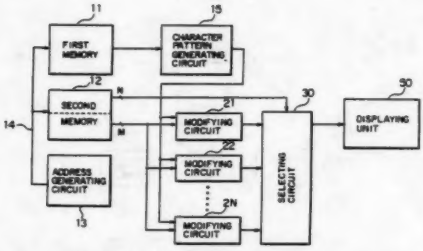
means for adding said products PiCj to providing an output convolution Pc as a first output.

5,151,954

DEVICE CAPABLE OF MODIFYING A CHARACTER ACCORDING TO A SELECTED ATTRIBUTE CODE

Kazuhito Takai, Tokyo, and Yukihiro Kimura, Gunma, both of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 20, 1990, Ser. No. 633,608
Claims priority, application Japan, Dec. 26, 1989, 1-337333
Int. Cl.[5] G06K *9/36*
U.S. Cl. 382—41 **4 Claims**



1. A modifying device for modifying a character into a modified signal, said modifying device comprising:

a first memory for memorizing a character code representative of said character;

a second memory for memorizing an attribute code and a selection code which cooperatively determine modification of said character;

supplying means for supplying an address signal to said first and said second memories to read out said character code, said attribute code, and said selection code;

a character pattern generating circuit responsive to the character code read out of said first memory for producing a character pattern;

first through N-th modifying means responsive to the attribute code read out of said second memory for modifying said character pattern into first through N-th modification signals, respectively, where N represents a positive integer which is not less than two; and

selecting means for selecting at least one of said first through said N-th modification signals as said modified signal in response to the selection code read out of said second memory.

5,151,955

OPTICAL ISOLATOR

Hiroshi Ohta, and Noriyuki Nakamura, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Shinkosha, Tokyo, Japan

Filed Nov. 9, 1990, Ser. No. 612,016
Claims priority, application Japan, Jun. 20, 1990, 2-160017; Oct. 12, 1990, 2-272335
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—6 **2 Claims**

1. An optical isolator comprising:

a pair of light waveguides;

plate-like first, second, third and fourth birefringent elements;

a first magneto-optic element interposed between said first and second birefringent elements; and

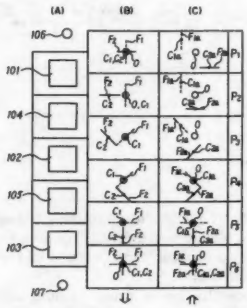
a second megneto-optic element interposed between said third and fourth birefringent elements,

said first birefringent element having a light penetrating end face and a plane of polarization which is perpendicular to said light penetrating end face and including a direction in which light is separated so that light emitted from one of said light waveguides and being incident on said first birefringent element is separated into two polarized components,

said second birefringent element having a light penetrating end face and a plane of polarization which is angled at nearly 45° relative to that of said first birefringent element about the normal line of said light penetrating end face of said second birefringent element,

said third birefringent element having a light penetrating end face and a plane of polarization which is angled at nearly 45° relative to that of said first birefringent element about said light penetrating end face of said third birefringent element and substantially perpendicular to that of said second birefringent element,

said fourth birefringent element having a light penetrating end face and a plane of polarization which is angled at nearly 45° relative to that of said third birefringent element about said light penetrating end face of said fourth birefringent element so as to synthesize two polarized



components transmitted across said second magneto-optic element,

said first magento-optic element being disposed to magnetically change directions of polarization of said polarized components transmitted across said first birefringent element,

said second magneto-optic element being disposed to magnetically change directions of polarization of said polarized components transmitted across said third birefringent element,

said first and second magneti-optic elements having a thickness which is so determined that said directions of polarization of said polarized components emanating from said first and second magneto-optic elements are angled at nearly 45° relative to those incident thereupon, and

said first and fourth birefringent elements being equal in thickness and said second and third birefringent elements having a thickness $\sqrt{2}$ times that of said first or fourth birefringent element.

5,151,956

WAVEGUIDE POLARIZER USING LOCALIZED SURFACE PLASMONS

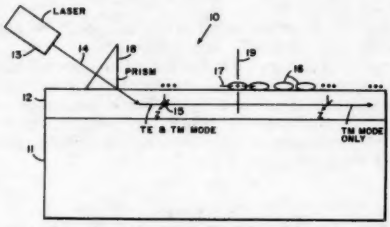
Mark J. Bloemer, Athens, Ala., assignor to The United Staes of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1991, Ser. No. 811,279
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—11 **11 Claims**

1. A waveguide polarizer utilizing the surface plasmon resonances in submicrometer-size metallic particles to polarize electromagnetic radiation comprising:

(i) a waveguide substrate for supporting said submicrometer-size metallic particles within an electromagnetic field of electromagnetic radiation propagating said waveguide polarizer;

(ii) submicrometer-size metallic particles selected from the group of metals consisting of silver, gold, copper, and aluminum deposited within said electromagnetic field and supported by said waveguide substrate, said submicrometer-size metallic particles having nonspherical shapes and having their major axes parallel to the surface of said waveguide substrate, said nonspherical shapes of submicrometer-size metallic particles having particles size up to 500 nanometers as measured along side of major axes, said nonspherical shapes of submicrometer-size metallic particles having a predetermined minor to major axis ratio and having two surface plasmon modes with each of said surface plasmon modes having a surface plasmon resonance within the wavelength of electromagnetic radiation propagating in said waveguide, said surface plasmon resonance wavelength achieving polarization of electromagnetic radiation by absorbing the wavelength of said electromagnetic radiation of plasmon resonance wavelength of one of said surface plasmon modes and passing the wavelength of said electromagnetic radiation of the surface plasmon resonance wavelength of the other of said surface plasmon modes, said electromagnetic radiation wavelength when impinging on said nonspherical shapes of submicrometer-size metallic particles with its electric field parallel to said major axis being passed and said electromagnetic radiation wavelength when impinging on said nonspherical shapes of submicrometer-size metallic particles with its electric field parallel to said minor axis being absorbed to thereby achieve polarization of said electromagnetic radiation propagating said waveguide.

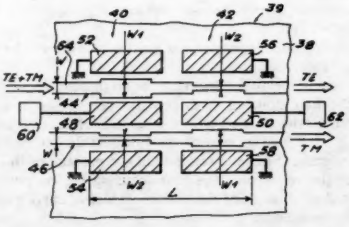


5,151,957

POLARIZATION BEAM SPLITTER FOR GUIDED LIGHT

Luc Riviere, Valbonne, France, assignor to France Telecom Etablissement Autonome de Droit Public (Centre National d'Etudes des Telecommunications), Issy les Moulineaux, France

Filed Oct. 23, 1991, Ser. No. 780,908
Claims priority, application France, Oct. 31, 1990, 90 13529
Int. Cl.[5] G02B 6/10
U.S. Cl. 385—41 **8 Claims**



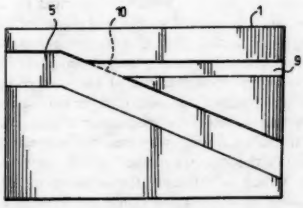
1. Polarization beam splitter for guided light, which comprises a directional coupler (**39**) having an alternating delta beta electrode structure, said coupler incorporating two sections (**40, 42**) adjacent to one another and two light guides (**44, 46**), one end (**64**) of one (**44**) of the two guides serving to receive an input lightwave, which is a combination of the two optical guided modes, namely a transverse-electrical mode TE and a transverse-magnetic mode TM, characterized in that the coupler is produced on a substrate (**38**) made from a material having a refractive index associated with the TE mode and a refractive index associated with the TM mode and which makes it possible to induce opposite variations respectively on the refractive indexes and in that the coupler is able to introduce, in the absence of a voltage between the electrodes, a delta beta variation between the propagation constants respectively corresponding to the symmetrical and anti-symmetrical propagation modes of the coupler, which is on the one hand independent of the polarization state of the lightwave guided by the splitter and on the other is such that the representative point of the coupler (**M1, M2, M3, M4**) on its control diagram is the centre of a segment parallel to the abscissa axis of the reference frame in which the diagram is plotted and which is defined by two points (**A1, B1; A2, B1; A1, B2; A2, B2**) respectively belonging to a curve (I) corresponding to crossed states of the coupler and to a curve (II) corresponding to parallel states of said coupler, so that for an appropriate electrical polarization of the latter, one of the two TE and TM modes of the input lightwave is obtained at the other end of the guide (**44**), which receives said input lightwave and the other mode at the corresponding end of the other guide.

5,151,958

ADAPTOR DEVICE FOR COUPLING TOGETHER OPTICAL WAVEGUIDES PRODUCED BY K-NA ION EXCHANGE WITH OPTICAL WAVEGUIDES PRODUCED BY AG-NA ION EXCHANGE

Seppo Honkanen, Naavatie, Finland, assignor to Oy Nokia AB, Helsinki, Finland

Filed Jul. 26, 1991, Ser. No. 736,514
Claims priority, application Finland, Aug. 23, 1990, 904186
Int. Cl.[5] G02B 6/26
U.S. Cl. 385—50 **4 Claims**



1. An adaptor device for coupling together optical waveguides produced by K-Na ion exchange and optical waveguides produced by Ag-Na ion exchange, wherein the adaptor device comprises an optical waveguide produced on a glass substrate by ion-exchange technique, in the fundamental mode of which waveguide the field distribution of light changes adiabatically in a longitudinal direction of the optical waveguide from the field distribution of light of the fundamental mode of an optical waveguide produced by K-Na ion exchange at a first end portion to the field distribution of light of the fundamental mode of an optical waveguide produced by Ag-Na ion exchange at a second end portion.

5,151,959

CONTROLLABLE INTEGRATED OPTICAL MACH-ZEHNDER INTERFEROMETER

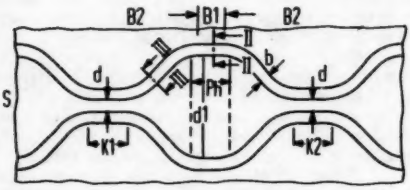
Gustav Mueller, and Lothar Stoll, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 14, 1991, Ser. No. 744,898

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1990, 4030755

Int. Cl.[5] G02B 6/26

U.S. Cl. 385—50 17 Claims



13. A controllable integrated optical Mach-Zehnder interferometer, comprising:

a substrate of semiconductor material;

first and second strip waveguides of a defined width integrated on the substrate and defined by waveguiding layers at the substrate;

in two coupling sections, the strip waveguides proceeding side-by-side and at a spacing from one another which is sufficiently small such that an optical wave guided in the waveguiding layer of one of the strip waveguides can couple over into the waveguiding layer of the other strip waveguide;

in a phase shifting section, the two waveguides being in side-by-side relationship and at a spacing which is sufficiently great such that an over-coupling of optical waves between the two strip waveguides is substantially prevented;

in said phase shifting section at least one of the strip waveguides having a rib of semiconductor material and a spacer layer arranged over its waveguiding layer and which defines a width of the at least one strip waveguide where the rib is present;

a semiconductor junction which is electrically controllable via contacts is integrated within said phase shifting section in a region of said rib of said at least one strip waveguide such that a transition from p-doped material of said rib to n-doped or undoped material of said spacer layer is arranged at a specified distance from the waveguiding layer, and wherein the rib of p-doped material is situated at a side of this transition facing away from the waveguiding layer;

the section of the strip waveguide within the phase shifting section which is adjacent the semiconductor junction comprising an electrically controllable strip waveguide section;

sections of the strip waveguides situated outside of the electrically controllable strip waveguide section forming passive strip waveguides which are free of semiconductor junctions; and

said passive strip waveguide sections which are free of pn- or pin-junctions comprising a rib forming a thicker region of the waveguiding layer, a width of said rib defining a width of the passive strip waveguide, and wherein on a side facing away from the substrate the surface of the waveguiding layer with the rib is in direct contact with a uniform material.

5,151,960

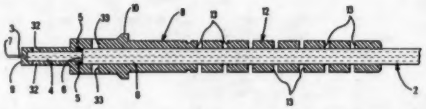
UNITARY OPTICAL FIBER CONNECTOR

Gary N. Warner, Harrisburg; Jason L. White, Duncannon; Edmund J. Haley, Dillsburg; Wallace R. Savitsky, and Ronald R. Schaffer, both of Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 8, 1991, Ser. No. 682,042

Int. Cl.[5] G02B 6/00, 6/36

U.S. Cl. 385—53 17 Claims



1. An optical fiber connector having an optical fiber holder fabricated in a molding die, and comprising:

an optical fiber and a flexible buffer and strength members of an optical fiber cable, and a holder of plastics material for aligning the fiber imbedding the fiber in the plastics material at a front end of the holder, and imbedding the buffer and the strength members and an exterior of the cable in the plastics material.

5,151,961

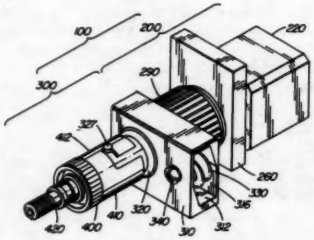
FERRULE ALIGNMENT ASSEMBLY FOR BLIND MATING OPTICAL FIBER CONNECTOR

Jaroslav M. Hvezda, Nepean; Robert W. Fisher, Ottawa; Edward J. Olszewski, Kanata; Hugh F. C. Morrin, and Richard J. Glover, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 20, 1992, Ser. No. 838,170

Int. Cl.[5] G02B 6/36, 6/42

U.S. Cl. 385—60 20 Claims



1. An assembly for axially aligning two ferrules, the assembly comprising:

a first housing having a passage;

a first ferrule ridigly mounted within the passage of the first housing;

an alignment sleeve carrier having a passage extending therethrough;

an alignment sleeve retained with the passage of the alignment sleeve carrier;

first securing means for securing the alignment sleeve carrier to the first housing with the passage of the alignment sleeve carrier aligned with the passage of the first housing and with a leading end of the first ferrule extending into the alignment sleeeve retained in the passage of the alignment sleeve carrier, the first securing means permitting limited movement of the alignment sleeve carrier relative to the first housing;

a second housing;

a socket member having a passage extending therethrough for receiving a second ferrule at one end of the passage of the socket member and a leading end of the alignment

sleeve carrier at another end of the passage of the socket member such that a leading end of the second ferrule can extend into the alignment seeve for axial alognment with said first ferrule when the alignment sleeve carrier is received in the passage of the socket member;

second securing means for securing the socket member to the second housing, the second securing means permitting limited movement of the socket member on the second housing;

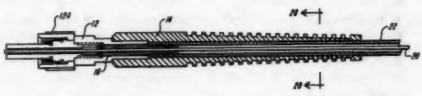
the limited movement of the alignment sleeve carrier relative to the first housing and the socket member relative to the second housing faciliating entry of the alignment sleeve carrier into the passage of the socket member and alignment of the first and second ferrules within the alignment sleeve.

5,151,962

FIBER OPTIC CABLE ASSEMBLIES FOR LASER DELIVERY SYSTEMS

James P. Walker, Arlington; Jack Aucoin, S. Attleboro, both of Mass., and Randall Drew, Cumberland, R.I., assignors to Fiber Delivery Concepts, Inc., Hudson, Mass.

Filed May 20, 1991, Ser. No. 703,020
Int. Cl.[5] G02B *6/44*
U.S. Cl. 385—86 **17 Claims**



1. A fiber optic cable assembly for use in a laser delivery system comprising:

an elongate optical fiber;

a jacket member axially surrounding said optical fiber;

means for optically coupling the optical fiber to a laser;

a cylindrical strain relief boot attached to said coupling means and axially surrounding a substantial length of said jacket member and said fiber, said boot having a proximal end with a first outer diameter and a distal end with a second outer diameter which is less than the first outer diameter, the boot further having a length wherein the ratio of the boot length to the first outer diameter is at least 7:1;

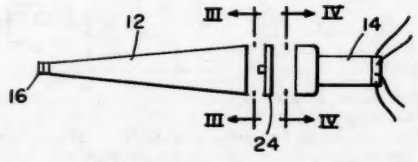
a support element axially surrounding a portion of said optical fiber and separating said optical fiber from said jacket member and said coupling means for maintaining the optical fiber in axial alignment with said laser.

5,151,963

APPARATUS FOR COUPLING AN OPTICAL TRANSDUCER TO A LIGHT GUIDE

Thomas E. Coan, Los Alamos, N. Mex., and Steven P. Ahlen, Brookline, Mass., assignors to Boston University, Boston, Mass.

Filed Mar. 5, 1991, Ser. No. 665,553
Int. Cl.[5] G02B *6/00, 6/36*
U.S. Cl. 385—88 **39 Claims**



1. An apparatus for coupling an electro-optical device to a transparent material, comprising:

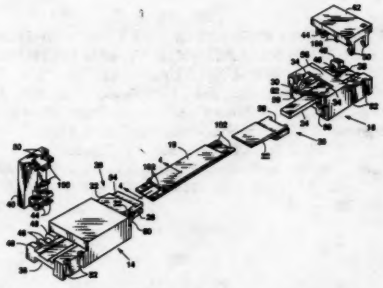
a stud extending parallel to a coupling axis along which the electro-optical device and transparent material are coupled, the stud engaging a receiving hole in which the stud is removably secured, the stud and the hole permitting light to be transmitted therethrough with each being fixedly located relative to a different one of the electro-optical device and the transparent material, and being located opposite one another during coupling such that relative motion of the electro-optical device and the transparent material toward one another along the coupling axis results in the engagement of the stud with the hole.

5,151,964

WEDGE-ACTUATED MULTIPLE OPTICAL FIBER SPLICE

James B. Carpenter; Donald G. Doss, both of Austin, and Frank J. Glatzl, Leander, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 6, 1991, Ser. No. 753,332
Int. Cl.[5] G02B *6/38*
U.S. Cl. 385—98 **19 Claims**



19. A multiple optical fiber splice device comprising:

a splice body having a slot therein and a cavity adjacent said slot, said cavity having a ramp, said splice body further having a generally rectangular tongue extending into said cavity, parallel with said slot, said tongue having first and second, generally parallel surfaces;

a splice element located in said slot of said splice body, said splice element including two generally rectangular plates, a central portion of one of said plates contacting said first surface of said tongue, and both of said plates having a width approximately equal to the width of said tongue, and a length greater than the length of said tongue; and

a wedge having first and second surfaces defining an acute angle of less than about 9°, said first surface of said wedge being generally parallel with and contacting said second surface of said tongue, and said second surface of said wedge being generally parallel with and contacting said ramp, said wedge further being locatable in first and second positions within said cavity, said plates being sufficiently separated when said wedge is in said first position to allow insertion of a plurality of optical fibers between said plates, and said wedge applying a clamping force to said splice element, urging said plates toward one another, when said wedge is in said second position.

5,151,965
DEVICE FOR DOUBLING THE FREQUENCY OF A LIGHT WAVE

Gerardus L. J. A. Rikken, and Constance J. E. Seppen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jan. 8, 1991, Ser. No. 638,881
Claims priority, application Netherlands, Jun. 20, 1990, 9001398
Int. Cl.[5] G02F *1/35*
U.S. Cl. 385—122 5 Claims

1. A device for doubling the frequency of a light wave comprising a non-linear optical medium of a synthetic resin composition for guiding a fundamental light wave, while forming a second harmonic wave, said medium comprising a waveguide having a spatially periodic structure for phase matching, characterized in that the waveguide is composed of a uniformly oriented synthetic resin composition in which alternately areas having a mutually different second order susceptibility are present in accordance with the desired spatially periodic structure.

5,151,966
OPTICAL FIBER SUITABLE FOR USE IN OPTICAL TIME DOMAIN REFLECTOMETRY AND METHOD OF MANUFACTURING IT

Claude Brehm, Montrouge; Jean-Yves Boniort, Limours; André Tardy, Egly, and Jacques Com-Nougue, Paris, all of France, assignors to Alcatel Fibres Optiques, Cedex, France

Filed Jun. 25, 1991, Ser. No. 720,338
Claims priority, application France, Jun. 26, 1990, 90 08017
Int. Cl.[5] G02B *6/10*; B23K *26/00*; B05D *5/06*
U.S. Cl. 385—128 8 Claims

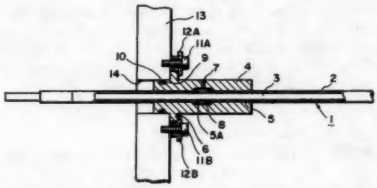
1. In a method of manufacturing an optical fiber suitable for use in optical time domain reflectometry comprising drawing of the fiber and depositing a thin continuous coating on the fiber during drawing, the improvement comprising removably ablating part of said coating to form a coating free helix coaxial with the fiber by rotating a laser beam in a plane orthogonal to said axis simultaneously with axial movement of the fiber to optimize microcurvature of the fiber according to its subsequent use.

6. Optical fiber suitable for use in optical time domain reflectometry comprising a thin coating on said optical fiber of carbon, silicon carbide, silicon nitride, a metal or a metal alloy, wherein said coating is interrupted in an area defining a coating free helix coaxial with the fiber to optimize the microcurvature of the fiber according to its subsequent use.

5,151,967
OPTICAL FIBER SEALING ASSEMBLY

Ryuichi Ebinuma, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1991, Ser. No. 737,023
Claims priority, application Japan, Jul. 31, 1990, 2-201155
Int. Cl.[5] G02B *6/26*
U.S. Cl. 385—138 8 Claims



1. A light guide device for guiding light from one side of a wall member to another side thereof, said device comprising:

light guide means having an optical fiber covered with a covering member, with said optical fiber having an uncovered portion not covered by said covering member;

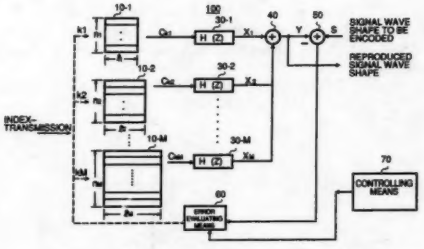
a first member having a throughbore for receiving said light guide means, with said first member being partially inserted into a mounting bore formed in the wall member, wherein said uncovered portion of optical fiber is positioned within said first member, and said first member includes an introduction hole for allowing introduction of a filling material around said uncovered portion of optical fiber; and

a second member for fixing said first member to the wall member, wherein said second member is positioned around the mounting bore and secured to the wall member.

5,151,968
VECTOR QUANTIZATION ENCODER AND VECTOR QUANTIZATION DECODER

Yoshinori Tanaka, Kawasaki; Tomohiko Taniguchi, Yokohama; Fumio Amano, Tokyo; Yasuji Ohta, Yokohama, and Sigeyuki Unagami, Atsugi, all of Japan, assignors to Fujitsu Limited, Japan

Filed Aug. 3, 1990, Ser. No. 562,604
Claims priority, application Japan, Aug. 4, 1989, 1-202418
Int. Cl.[5] G10L *3/00*
U.S. Cl. 395—2 17 Claims



1. A vector quantization encoder in a vector quantization device comprising:

codebook means for storing a plurality of indexed code vectors and for providing one of the indexed code vectors in response to an code vector index signal,

synthesis filters for reproducing speech signals based on the indexed code vector provided by said codebook means,

addition means for adding the reproduced speech signals provided by said synthesis filters together to form a reproduced speech signal,

error computing means for receiving an input speech signal and for computing a minimum error power valve by determining a difference between the reproduced speech signal and the input speech signal; and

evaluating means for selecting the code vector index which minimizes the minimum error power value due to the difference between the reproduced speech signal and the input speech signal to be encoded and for supplying the selected code vector index to said codebook means, wherein:

said codebook means includes a plurality of separate codebooks, each stores indexed code vectors for a different frequency band;

each of said separate codebooks is provided with one of said synthesis filters;

said addition means forms the reproduced speech signal based on which the minimum error power value is to be found; and

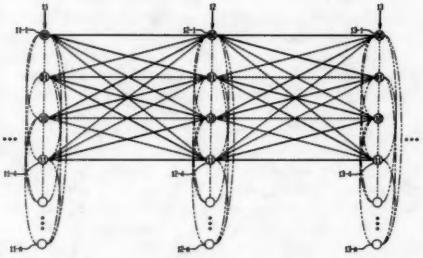
said evaluating means includes means for selecting indices corresponding to said respective separate codebooks as well as indices for the indexed code vectors of said respective separate codebooks based on the minimum error power value.

5,151,969

SELF-REPAIRING TRELLIS NETWORKS

Thomas Petsche, Cranbury, N.J., assignor to Siemens Corporate Research Inc., Princeton, N.J.

Filed Mar. 29, 1989, Ser. No. 330,340
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—24 11 Claims



1. A network for storing and processing signal representations, the network comprising:

a plurality of stages and weighting matrix means interconnecting stages together;

each stage comprising a plurality of processing means grouped into two sets wherein one set includes active processing means and a second set includes spare processing means, the active processing means being nodes in the network, and the weighting matrix means connecting each node in a stage via paths to all the nodes in adjacent stages wherein selected paths according to an underlying convolution code are favored over remaining paths;

inhibiting means connecting the processing means of the two sets together, the inhibiting means cooperating with the processing means to favor the activation of a single processing means in each stage; and

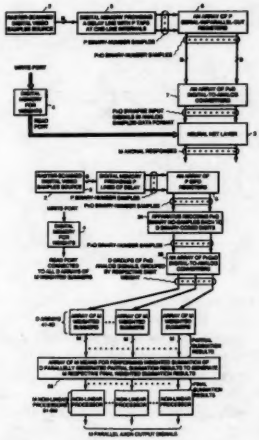
the weighting matrix means allowing only the activation of one processing means in a stage when activated nodes in different successive stages are interconnected by selected paths through the weighting matrix means.

5,151,970

METHOD OF GENERATING, IN THE ANALOG REGIME, WEIGHTED SUMMATIONS OF DIGITAL SIGNALS

William E. Engeler, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 546,970, Jul. 2, 1990. This application Jun. 28, 1991, Ser. No. 722,801
Int. Cl.[5] G06F *7/52, 15/40*
U.S. Cl. 395—24 8 Claims



1. A method for operating electronic apparatus for generating a weighted summation of digital input signals as manifested in electric signal form, each sample of said digital input signals having a plurality B in number of bits identified by respective ones of consecutive ordinal numbers first through B^{th} assigned in order of decreasing significance, said method for operating electronic apparatus comprising the steps of:

supplying each of said digital input signals in a respective stream of samples of only that said digital input signal, such that there are corresponding samples of said digital input signals in each of said streams which corresponding samples are parallel in time with each other;

recoding each B-bit sample of said digital input signals into a plurality D in number of binary-coded digits, as manifested in electric signal form and as identified by consecutive ordinal numbers first through D^{th} assigned in order of decreasing significance of weightings respectively assigned to the D binary-coded digits, B and D being respectively a relatively larger positive integer and a relatively smaller positive integer;

converting each set of temporally aligned digits to a set of corresponding analog electric signals consisting of D subsets each containing analog electric signals corresponding to digits of similar assigned weighting;

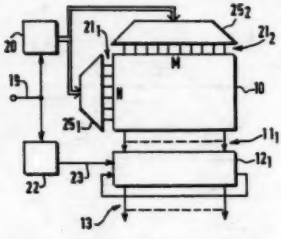
performing a weighted summation procedure on each of said D subsets of analog electric signals to obtain a respective partial weighted summation result manifested in electric signal form, thereby to generate streams of partial weighted summation results as manifested in electric signal form suitable for the next step of said method for generating a weighted summation of digital input signals; and

performing a weighted summation procedure on corresponding samples of said streams of partial weighted summation results, thereby to obtain a stream of final weighted summation results as manifested in electric signal form.

5,151,971
ARRANGEMENT OF DATA CELLS AND NEURAL NETWORK SYSTEM UTILIZING SUCH AN ARRANGEMENT

Christian P. M. Jousselin, Puteaux, and Marc A. G. Duranton, Boissy Saint Leger, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 439,717, Nov. 20, 1989, Pat. No. 5,075,889.
This application Oct. 10, 1991, Ser. No. 775,653
Claims priority, application France, Nov. 18, 1988, 88 14999
Int. Cl.[5] G06F *15/18*
U.S. Cl. 395—27 11 Claims



1. A layered neural network system comprising:

a) resolving means for determining, for each layer, states of output neurons i based on input neurons j which are interconnected by way of synapses,

b) means for storing synaptic coefficients C_{ij} associated with these synapses,

c) means for training and for updating the synaptic coefficients C_{ij}; and

d) means for storing the neuron states,

wherein the improvement comprises that

the means for storing the synaptic coefficients comprises at least one word-organized memory arrangement comprising:

a plurality of data cells arranged in rows and columns to form a matrix,

a single output bus comprising a plurality of lines for supplying a data word corresponding to a plurality of the bits stored in a row or column of the matrix;

at least a plurality of first and a plurality of second switches, each of said first switches being connected in series with a different one of said second switches between one of said cells and one of said lines of said output bus;

means for addressing said matrix in a first mode such that the stored bits appear as a word in a first bit arrangement on said single output bus,

means for addressing said matrix in a second mode such that, with the same cell contents in the matrix, the stored bits appear as a word in a second bit arrangement on said same single output bus, and

said addressing means being connected to such matrix such that, in either addressing mode, a same selection signal when applied to the matrix will activate the same switches thereby addressing the same word stored in the matrix.

5,151,972
APPARATUS FOR AUTOMATICALLY CONNECTING TERMINAL DEVICE TO TELEPHONE LINES

Alan S. Lorenz, Seattle, and Christopher K. Sutton, Everett, both of Wash., assignors to Lynx Automation, Inc., Seattle, Wash.

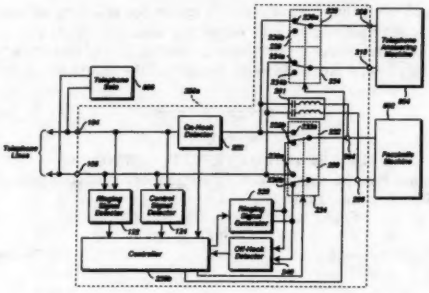
Continuation of Ser. No. 329,576, Mar. 28, 1989, abandoned.
This application Mar. 13, 1991, Ser. No. 668,730
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—93 23 Claims

1. An apparatus for automatically routing an incoming data telephone signal on a pair of telephone lines to a data receiving terminal device such as a facsimile machine for use with a telephone system with one or more telephone devices connected directly to the telephone lines and independent of and unaffected by the connection of the apparatus to the telephone lines, the apparatus being operable in at least one response mode which allows an incoming call on the telephone lines to be answered by any one of the telephone devices connected directly to the telephone lines, comprising:

a connector to connect the apparatus in parallel with the telephone lines;

a ringing signal detector operable in said response mode to detect a ringing signal of an incoming call on the telephone lines without taking the telephone system off-hook, and generate a ringing detection signal if a ringing signal is detected;

a control signal detector operable in said response mode to detect a predetermined control signal on the telephone lines during an incoming call which has been answered by one of the telephone devices connected directly to the



telephone lines, and generate a control detection signal if said predetermined control signal is detected;

a controller, coupled to said ringing signal detector and said control signal detector, and operable in said response mode to generate a switching control signal in response to receipt of said ringing detection signal from said ringing signal detector followed by receipt of said control detection signal from said control signal detector; and

a first switch, coupled between the telephone lines and the terminal device, which selectively connects the terminal device to the telephone lines, said first switch having an idle first mode during which the terminal device is disconnected from the telephone lines, and a second mode during which the terminal device is connected to the telephone lines, said first switch being in said first mode while the apparatus is awaiting detection of both a ringing signal of an incoming call and said predetermined control signal on the telephone lines, and said first switch switching to said second mode in response to receipt of said switching control signal from said controller.

5,151,973
PRINTING APPARATUS AND INFORMATION PROCESSING APPARATUS USING THE SAME

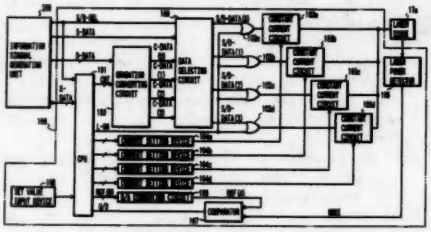
Akira Sasaki; Takeshi Kato, and Akiyoshi Hakoyama, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 16, 1991, Ser. No. 701,042
Claims priority, application Japan, May 18, 1990, 2-126720
Int. Cl.[5] G06K *15/00*
U.S. Cl. 395—109 19 Claims

1. In a printing apparatus in which a dot printing element is controlled in accordance with an image information signal transmitted from an image information signal generating unit and a visual image expressed by dots is formed, said dot printing element is controlled through a main control unit, said main control unit comprises a first control means, said first

control means of the main control unit controls said dot printing element so as to print a dot having a predetermined dot size in accordance with an existence of a dot signal in said image information signal, the printing apparatus characterized in that,

said main control unit includes further a second control means and a control selection means;



said second control means of said main control unit controls said dot printing element so as to vary a size of the dot of a dither dot matrix which is expressed in accordance with a gradation signal of said image information signal; and

said control selection means of said main control unit operates selectively said first control means of said main control unit and said second control means of said main control unit.

5,151,974

DATA DISPLAY METHOD

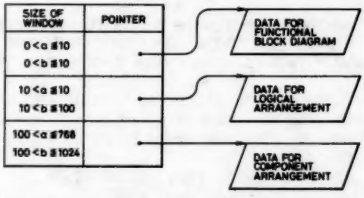
Masayuki Tani; Kunio Nakanishi; Atsushi Kawabata; Norito Watanabe, all of Hitachi; Takanori Yokoyama, Hitachiota, and Shinya Tanifuji, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1987, Ser. No. 79,046

Claims priority, application Japan, Jul. 31, 1986, 61-178659

Int. Cl.[5] G06F *3/153*

U.S. Cl. 395—128 **15 Claims**



8. A data display method in a graphic data processing system having a display screen, a storage which stores graphic data, and a pointing device for designating a window of a given size at a desired position within the display screen, characterized by the following steps:

storing the graphic data structured in a hierarchy of plural concept levels in the storage;

setting plural criteria for judging a parameter of the window, each of the judging criteria being made to a correspond to respective one of the concept levels of the graphic data stored in the storage;

designating a window within the display screen by the pointing device;

judging to what criterion of the parameter the designated window belongs and selecting the graphic data of the concept level corresponding to the criterion of the parameter, to which the designated window belongs, from among the graphic data stored in the storage; and

displaying the selected graphic data within the designated window.

5,151,975

WORD PROCESSOR WITH TEXT LAYOUT DISPLAY FUNCTION

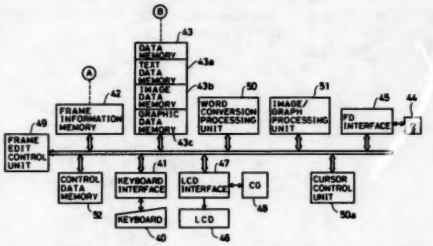
Tatsuya Shiraki, Nara, and Makoto Kado, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 409,424, Sep. 19, 1989, abandoned. This application Aug. 22, 1991, Ser. No. 750,770

Claims priority, application Japan, Sep. 30, 1988, 63-247748

Int. Cl.[5] G06F *3/14, 3/153*

U.S. Cl. 395—153 **4 Claims**



1. A word processor with a text layout display function, comprising:

input means for entering character string text data and for inputting instructions to readout a text frame;

text frame storage means for storing a plurality of text frame types;

format storage means for storing a text format for display within a text frame;

text frame readout means for reading out from the text frame storage means, in response to an instruction from the input means, a single text frame;

displaying means including a screen for concurrently displaying on the screen an input region within which text data entered from said input means is displayable as the text data is entered from said input means and a text frame display region within which the text data entered from said input means is displayable, as the text data is entered from said input means, in a layout format defined by the text format stored in said format storage means;

display control means for concurrently displaying test data entered from said input means in said input region and the text frame read out from said text frame storage means in said text frame display region;

first cursor display means for displaying a first position-identifying cursor within the input region at a location at which text data is entered from said input means;

output means for displaying, in said text frame display region, the text data in said input region in a layout format defined by the text format stored in said format storage means, and for concurrently displaying in the text frame display region of the display means screen, as new character string text data is entered from said input means and is displayed in the input region of the display means screen, the new text data in a layout format defined by the text format stored in said format storage means;

dividing means for dividing the text frame into a plurality of concurrently displayed frame regions;

frame region selecting means for selecting any one of the plural frame regions for receiving new text data entered from said input means in layout format;

second cursor display means for displaying, concurrently with the display of said first cursor in the input region, a second cursor within said selected frame region at a location relative to the layout formatted text data displayed in said selected frame region that corresponds to the location of the first cursor in the input region relative to the text data concurrently displayed in said input region; and

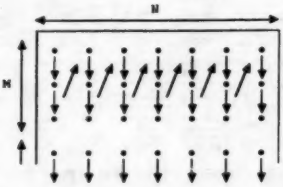
input region identifying means for identifying and displaying in the selected frame region, in layout format, the new text data concurrently entered and displayed in the input region.

5,151,976

DEVICE FOR CONVERTING A LINE SCANNING INTO A VERTICAL SAW TOOTH SCANNING THROUGH STRIPES

Alain Artieri, Meylan, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Jul. 26, 1990, Ser. No. 557,862
Claims priority, application France, Jul. 27, 1989, 89 10385
Int. Cl.[5] G06F *15/68*
U.S. Cl. 395—166 **4 Claims**



1. A device for converting a horizontal scanning of successive lines of N data into a saw tooth scanning of stripes, each stripe having a height of M lines, said device comprising:

M×N words of memory, wherein are sequentially written into the first MN horizontally scanned data then wherein following horizontally scanned data are sequentially written while stored data are read out at same successive addresses $A_{i,j}$ to provide saw tooth scanning output data, where i is a sequence number of the data in the memory ($0<i<MN-1$) and j is a stripe number ($1<j<n$); and

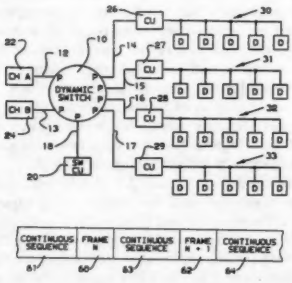
an address generator circuit for supplying said addresses $A_{i,j}$ to said memory, wherein $A_{i+1,j}=(A_{i,j}+x_j)$ Modulo (MN-1), x_j being a number such that $x_{j+1}=N.x_j$ Modulo (MN-1) and $x_1=1$.

5,151,977

MANAGING A SERIAL LINK IN AN INPUT/OUTPUT SYSTEM WHICH INDICATES LINK STATUS BY CONTINUOUS SEQUENCES OF CHARACTERS BETWEEN DATA FRAMES

Kenneth J. Fredericks, Poughkeepsie, and Kenneth R. Lynch, Rhinebeck, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 31, 1990, Ser. No. 575,923
Int. Cl.[5] H04L *7/00*; G06F *3/04, 15/16, 11/20*
U.S. Cl. 395—200 **9 Claims**



1. A link-level facility for sending and receiving data transfers over a link in an input/output system, said link-level facility comprising:

continuous sequence generating means connected to said link for generating continuous sequences for transmission over said link from said link-level facility, said continuous sequence indicating the operating status of said link;

frame generating means connected to said link for generating frames for transmission over said link from said link-level facility;

synchronizing means connected to said continuous sequence generating means and said frame generating means for synchronizing the transmission of frames with the transmission of said continuous sequences such that said frames are intermediate successive ones of said continuous sequences;

receiving means connected to said link for receiving continuous sequences and frames transmitted over said link to said link-level facility; and

state machine means connected to said receiving means, said frame generating means and said continuous sequence generating means, said state machine means for controlling said frame generating means and said continuous sequence generating means, said state machine having a recognition means connected to said receiving means for recognizing continuous sequences received by said receiving means from said link for determining if said link has a frame-transmitting status or a non-frame-transmitting status, a first state means connected to said frame generating means for allowing transmission of frames from said frame generating means over said link when said recognition means determines that the last continuous sequence received by said receiving means indicates said link has a frame-transmitting status, and

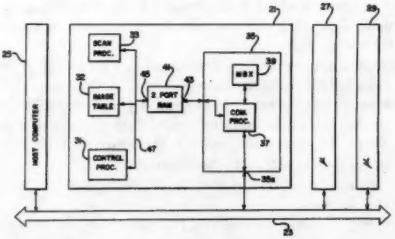
a second state means connected to said frame generator for preventing transmission of frames from said frame generating means over said link when said recognition means determines that the last continuous sequence received by said receiving means indicates said link has a non-frame-transmitting status.

5,151,978

LAN INTERFACE WHICH PERMITS A HOST COMPUTER TO OBTAIN DATA WITHOUT INTERRUPTING A LADDER PROGRAM EXECUTING IN THE INTERFACE

Joseph T. Bronikowski, Milwaukee; Brian T. Hill, Mequon; David J. Sackmann, Milwaukee, and Mark S. Weber, Germantown, all of Wis., assignors to Square D Company, Palatine, Ill.

Filed Mar. 22, 1990, Ser. No. 497,451
Int. Cl.[5] G06F *13/12*
U.S. Cl. 395—200 **10 Claims**



1. A programmable logic controller for communication on a high speed serial data communication network, said programmable logic controller having means for executing a ladder program and including integral means for directly coupling to said communications network, said programmable logic controller comprising:

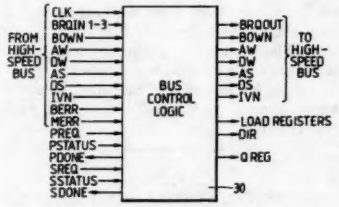
(a) first port, said first port adapted to couple to said communications network;
(b) a communications processor coupled to said first port;
(c) a random access memory means coupled to said communications processor for storing messages from said communications network as a mailbox register;
(d) a data bus;
(e) a scan processor means coupled to said data bus for executing said ladder program;
(f) an image table coupled to said data bus, said image table having means for storing data directly from said communication network for use by said scan processor means and means for storing data from said scan processor means for use by said communication network;
(g) a two port RAM having a first port coupled to said communications processor and a second port coupled to said data bus;
(h) a control processor means coupled to said data bus for controlling said storing means of said image table and for transferring data between said image table and said mailbox register or said communications network through said two-port RAM; and
(i) wherein said first port, said communications processor, and said mailbox register combine to form said integral means for directly coupling said programmable logic controller to said communications network, said integral means functioning as an equivalent network interface module.

5,151,979

DATA PROCESSING SYSTEM WITH INFORMATION TRANSFER BUS AND WAIT SIGNAL

Geoffrey Poskitt, Camberley, Great Britain, assignor to International Computers Limited, London, England

Filed Mar. 20, 1989, Ser. No. 325,785
Claims priority, application United Kingdom, Apr. 9, 1988, 8808353
Int. Cl.[5] G06F *13/36, 13/42*
U.S. Cl. 395—325 **2 Claims**



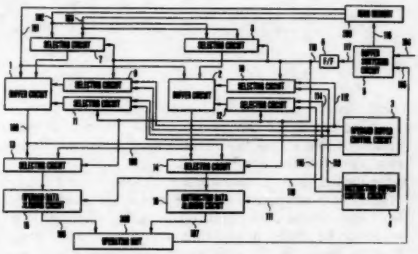
1. A data processing system comprising:
(a) a plurality of functional units,
(b) a bus interconnecting the functional units to allow transfer of addresses and data between the functional units, and
(c) an ADDRESS WAIT signal path and a DATA WAIT signal path interconnecting the functional units,
(d) wherein at least a first one of the functional units comprises means for asserting an ADDRESS WAIT signal on said ADDRESS WAIT signal path whenever that functional unit is unable to accept an address from the bus, and for asserting a DATA WAIT signal on said DATA WAIT signal path whenever that functional unit is unable to accept data from the bus,
(e) wherein at least a second one of the functional units comprises means for placing an address on the bus for one clock cycle, means responsive to absence of the ADDRESS WAIT signal during said one clock cycle for withdrawing said address from the bus at the end of said clock cycle, means responsive to assertion of the ADDRESS WAIT signal for holding the address on the bus for as long as the ADDRESS WAIT signal is asserted, means for placing data on the bus for a single clock cycle, means responsive to absence of the DATA WAIT signal during said single clock cycle for withdrawing said data from the bus at the end of said single clock cycle, and means responsive to assertion of the DATA WAIT signal for holding the data on the bus for as long as the DATA WAIT signal is asserted,
(f) and wherein each said clock cycle is substantially equal to the time required for one-way propagation of information over said bus between said second one of the functional units and said first one of the functional units.

5,151,980

BUFFER CONTROL CIRCUIT FOR DATA PROCESSOR

Atsushi Yamazaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 348,507, May 8, 1989, abandoned. This application Feb. 21, 1992, Ser. No. 837,607
Claims priority, application Japan, May 11, 1988, 63-114386
Int. Cl.[5] G06F *9/30*
U.S. Cl. 395—375 **1 Claim**



1. A buffer control circuit for a data processor, said buffer control circuit comprising:
a buffer switching flip-flop, said buffer switching flip-flop inverting its output whenever a branch condition of a conditional branch instruction is satisfied;
a first buffer circuit selectively serving as an instruction buffer and as an operand buffer in accordance with said output of said buffer switching flip-flop;
a second buffer circuit serving as an operand buffer when said first buffer circuit serves as an instruction buffer and serving as an instruction buffer when said first buffer circuit serves as an operand buffer;
writing means for reading out prefetched instruction data at a branch destination from a main memory and for writing said instruction data into one of said first and second buffer circuits serving as an operand buffer when an instruction decode signal indicates a branch instruction; and
buffer selecting means for selecting one of said first and second buffer circuits serving as an operand buffer, for reading out instruction data at said branch destination from the selected buffer circuit, and for outputting said instruction data to an operating unit in accordance with said output of said buffer switching flip-flop when satisfaction of a condition of said branch instruction is signaled.

5,151,981

INSTRUCTION SAMPLING INSTRUMENTATION

Douglas W. Westcott, Rhinebeck, and Valerie White, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 13, 1990, Ser. No. 552,389
Int. Cl.[5] G06F *11/30, 9/34*
U.S. Cl. 395—375 **7 Claims**

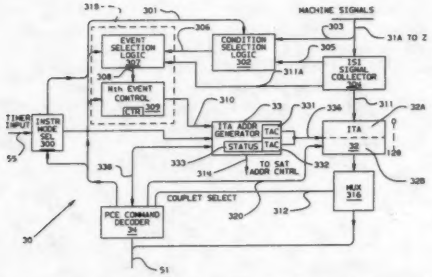
1. An apparatus for monitoring execution of instructions in an out-of-sequence execution machine of a type that tags each

instruction in an execution pipeline with an instruction identification number, comprising:

a memory;

first detection means for detection processing by said machine, of an instruction having a preselected instruction identification number;

temporary storage for capturing data associated with the processing of said instruction having said preselected instruction identification number, said temporary storage means being in communication with and responsive to said first detection means;



second detecting means for detecting a signal from said machine indicating that said machine has completed execution of said instruction having said preselected instruction identification number; and

trigger means, in communication with said second detecting means, said temporary storage means and said memory, for causing said data captured in said temporary storage means to be stored in said memory responsive to completion of execution of said instruction having said preselected instruction identification number,

wherein, only data associated with processing of completed ones of said instructions having said preselected instruction identification number is captured in said memory.

5,151,982

DATA PROCESSING SYSTEM

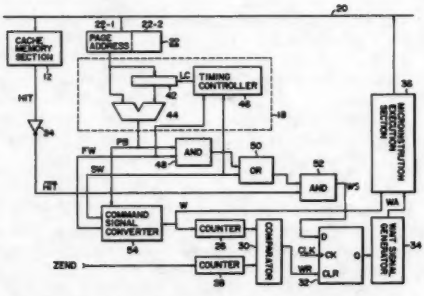
Shohei Suzuki, Tachikawa, and Isao Sakuma, Oome, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1989, Ser. No. 329,210

Claims priority, application Japan, Mar. 30, 1988, 63-76942; Apr. 8, 1988, 63-85431

Int. Cl.[5] G06F *12/08*

U.S. Cl. 395—425 **7 Claims**



1. A system with a cache memory for executing a series of write microinstructions at high speed, comprising:

memory means, including a main memory for storing data and a cache memory, said cache memory being accessed at a higher speed than said main memory and storing a copy of data stored in said main memory;

execution means for receiving a series of write microinstructions, generating an access virtual address including a page address and a write instruction signal, and writing data to said memory means;

miss-hit discrimination means for discerning whether or not a page indicated by the virtual address output from said execution means is present in said cache memory and for generating a miss-hit signal representing a cache miss-hit when the page is not present;

detection means for detecting whether or not a virtual address, generated by said execution means and associated with a currently executed write microinstruction, represents a new page not addressed by the previously executed write microinstruction, and generating the resulting detection signal;

wait means for causing said execution means to wait before executing the currently executed write microinstruction when a new page is indicated and a miss-hit of the cache memory occurs, all in response to the miss-hit signal and the detection signal representing the new page;

said detection means comprising:

holding means for holding a page address generated for a new write microinstruction before the current write microinstruction is executed, and

comparing means for comparing the page address held in said holding means with a page address generated for the currently executed write microinstruction, and generating a signal in accordance with the comparative result; and

said wait means including:

an instruction convertor for generating a first signal indicative of an initial write microinstruction and a second signal indicative of subsequent write microinstructions, in response to the write instruction signal supplied from said execution means,

AND circuit for outputting an output signal of the second signal and the signal supplied from said comparing means,

an OR circuit for outputting a signal from said AND circuit and the first signal,

a second AND circuit for outputting a signal from said OR circuit and a miss-hit signal, and

setting means for setting said execution means in a wait state in response to a signal output from said second AND circuit.

5,151,983

MICROCOMPUTER SYSTEM WITH SELECTIVELY BYPASSED MEMORY OUTPUT LATCHES

Yukihiro Nishiguchi, c/o NEC Corporation, 33-1, Shiba 5-chome, Minato-ku, Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 325,803

Claims priority, application Japan, Mar. 18, 1988, 63-66455; May 25, 1988, 63-128842

Int. Cl.[5] G06F *13/00, 13/12;* **G11C** *7/00*

U.S. Cl. 395—425 **4 Claims**

1. A microcomputer system which includes a memory storing processing data including instruction codes, and a data processor for executing a given instruction, the system comprising:

address indication means for storing an address for the memory and for supplying a stored address to the memory,

updating means for updating contents of the address indication means,

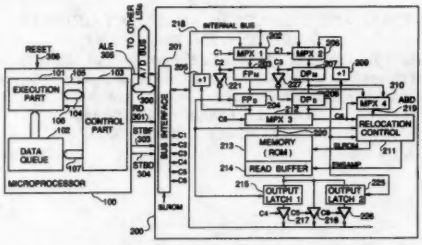
hold means for holding a content read out from the memory in accordance with the address supplied from the address indication means,

control means for controlling the updating means and the hold means,

first transfer means for controlling the address indication

means and the hold means so as to cause a one-time transfer to be performed, without using the hold means as an intermediary, between the memory and the data processor after an address is supplied from the data processor to the address indication means, and

second transfer means for putting the control means in an operating condition to cause the hold means to hold the



contents which are read out from the memory at the address supplied by the address indication means, and also to cause the updating means to update the contents of the address indication means such that a continuous transfer is realized between the memory and the data processor through the hold means as an intermediary without continuously supplying addresses from the data processor.

5,151,984

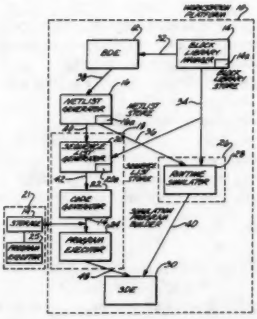
BLOCK DIAGRAM SIMULATOR USING A LIBRARY FOR GENERATION OF A COMPUTER PROGRAM

William C. Newman, 191 Madison Ave., San Bruno, Calif. 94066; Paul F. Titchener, 361 Arlington St., San Francisco, Calif. 94131, and Douglas B. Powell, 201 Fifth Ave., Apt. 12, San Francisco, Calif. 94118

Continuation of Ser. No. 173,771, Mar. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 65,372, Jun. 22, 1987, abandoned. This application Dec. 20, 1990, Ser. No. 631,186

Int. Cl.[5] G06F *15/00*

U.S. Cl. 395—500 **41 Claims**



1. In a method using a programmed computer for generation of a computer program which represents any of a plurality of different systems where each such system comprises first and second system blocks interconnected between inputs and outputs of the system blocks in a functionally operative system, some of said system blocks being functionally different from others,

any said input connected to any said output defined by such output, any said second system block having a delay and an output, which at one time, is dependent on the condition of at least one said input to the same said second system block at a prior time or the condition of both at least one said input to the same second system block at a prior time and at least one said input to the same second system block at a current time,

the method using sequencer program, a stored library and a stored network list,

the library comprising a plurality of different library blocks, a different said library block corresponding to and representing each functionally different one of the system blocks in all of said systems,

any said stored network list for a system representing the identity of each system block and the interconnections of the inputs and outputs of the system blocks in such system,

each said library block comprising representations of the functional characteristics of the corresponding first or second system block, the representations of characteristics for each library block, for a corresponding system block, comprising

if such system block is a first system block, representations of at least one update output procedure which defines, at a current time, the output of the corresponding first system block as a function of each input thereof at the current time, and

if such system block is a second system block, representations of an update state procedure which, at a current time, defines a state for the corresponding second system block as a function of at least one input for the corresponding second system block at a prior time, and representations of at least one update output procedure which, at a current time, defines the output of the corresponding second system block as a function of either the current state of the corresponding second system block or the current state of the corresponding second system block and at least one input of the corresponding second system block at the current time,

the method comprising the steps of

using the sequencer program for operating the computer for thereby processing the content of the network list and the library for forming a sequence of representations of the procedures in the library blocks, which library blocks correspond to those system blocks which are identified in the network list, and comprising the steps of checking the library blocks which correspond to system blocks identified in the network list to determine if each such library block corresponds to a second system block and if so including in the sequence for each such library block which corresponds to a second system block a representation of the update state procedure separate from the update output procedure for such library block.

5,151,985

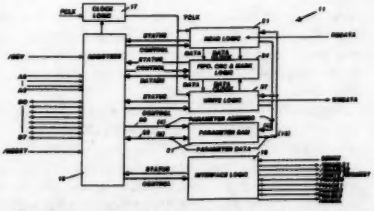
DISK DRIVE CONTROLLER

Wendell Sander, and Brian Sander, both of Campbell, Calif., assignors to Apple Computer Inc., Cupertino, Calif.

Continuation of Ser. No. 55,443, May 28, 1987, abandoned. This application Apr. 27, 1990, Ser. No. 518,307

Int. Cl.[5] G06F *3/00, 13/10*

U.S. Cl. 395—500 **3 Claims**



1. A disk drive controller for controlling the transfer of data

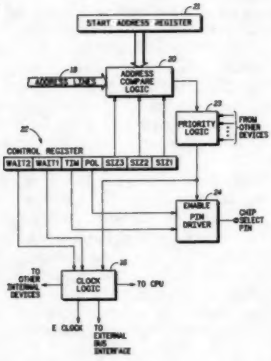
between a computer and a disk drive which puts data generated by the computer on a magnetic media based upon a write signal generated by the controller and which reads data on the magnetic media and generates a read signal representing the read data, said computer including a clock for generating a clock signal which operates at a predetermined clock speed, an address bus and a data bus, said controller comprising a register block means coupled to said address bus and said data bus for temporarily storing data for use by said controller and said computer, read logic means coupled to said register block means for receiving and converting said read signal generated by the drive to data for placement on the data bus, and write logic means coupled to said register block means for converting data on the data bus to said write signal for recording on the magnetic media, a random access memory coupled to said read logic means, said write logic means and said register block means, said memory for storing parameters generated by said computer and used by said read logic means and said write logic means to enable the controller to read data and write data to constant angular velocity disk drives and constant linear velocity disk drives.

5,151,986

MICROCOMPUTER WITH ON-BOARD CHIP SELECTS AND PROGRAMMABLE BUS STRETCHING

John A. Langan, Austin, and James M. Sibigtroth, Round Rock, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 27, 1987, Ser. No. 90,180
Int. Cl.[5] G06F *1/04*
U.S. Cl. 395—550 **10 Claims**



1. A microcomputer comprising:

central processing unit means for executing instructions, operating on data and interacting with peripheral devices;

internal address and data buses internal to said microcomputer and coupled to said central processing unit means;

a peripheral device;

external bus interface means coupled to said internal address and data buses for coupling external peripheral devices external to said microcomputer to said internal address and data buses, said external bus interface means further comprising:

(1) first programmable chip select means for providing a first chip select output signal if an address provided by said central processing unit means is within a first address range which has been selected by said central processing unit means; and

(2) programmable bus cycle stretch means for asserting a first control signal if an address provided by said central processing unit means is within said first address range and if said central processing unit has programmed said programmable bus cycle stretch means to be active concurrent with said first chip select output signal; and

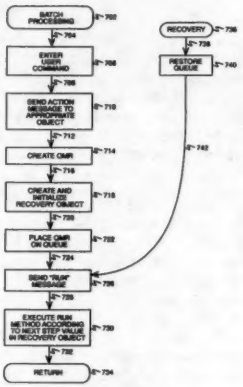
clock logic means for providing timing signals to said central processing unit means, said peripheral device, said external bus interface means and to said external peripheral devices, said clock logic means being responsive to a first control signal to freeze said timing signals provided to said central processing unit, said external bus interface means and said external peripheral devices and to leave said timing signal provided to said peripheral device unaffected.

5,151,987

RECOVERY OBJECTS IN AN OBJECT ORIENTED COMPUTING ENVIRONMENT

Robert L. Abraham; Michael P. Priven, both of Marietta, and Thomas P. Moorman, Atlanta, all of Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1990, Ser. No. 602,443
Int. Cl.[5] G06F *15/00, 12/00*
U.S. Cl. 395—575 **29 Claims**



1. A method for recovering from computer failures in an object oriented computing environment, said method adapted to operate on one or more computer platforms and comprising the steps of:

(a) creating persistent recovery objects associated with object instances having object instance methods, each of said object instance methods comprising:

(1) multiple committable actions which cannot safely be re-executed; and

(2) multiple commit messages;

(b) storing recovery information sufficient to recover from the failures in said recovery objects;

(c) committing committable data, including said recovery information, to a non-volatile storage device.

5,151,988

INTERSYSTEM DATA BASE SHARING JOURNAL MERGE METHOD

Mamio Yamagishi, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 154,952, Feb. 10, 1988, abandoned. This application Sep. 6, 1990, Ser. No. 579,110
Claims priority, application Japan, Feb. 18, 1987, 62-33279
Int. Cl.[5] G06F *15/40*
U.S. Cl. 395—600 **19 Claims**

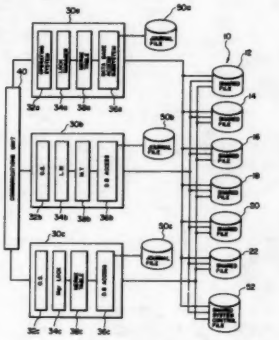
1. A computer system comprising:

a plurality of shared files for storing shared information:

a plurality of host processors for each independently processing transactions and for generating and maintaining end transaction counts each indicating a number of trans-

action processed by each host processor, each transaction altering information in one of the shared files when communicated thereto, the host processors being operatively connected with the shared files such that each processor can alter shared information in each of the shared files when communication between each processor and the shared files is established;

a plurality of journal files, each journal file being operatively connected with one of the host processors for storing an



accumulated history record of transactions processed thereby and the end transaction counts;

a communication unit for connecting the processors and providing communication therebetween such that at least the end transaction counts are exchanged among the host processors for updating the end transaction counts stored in the journal files to establish a relative time sequence among the transactions independently performed by the plurality of host processors and stored in the plurality of journal files.

5,151,989

DIRECTORY CACHE MANAGEMENT IN A DISTRIBUTED DATA PROCESSING SYSTEM

Donavon W. Johnson, Georgetown; Amal A. Shaheen-Gouda, and Todd A. Smith, both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 13, 1987, Ser. No. 14,889

Int. Cl.[5] G06F *15/16, 13/00*

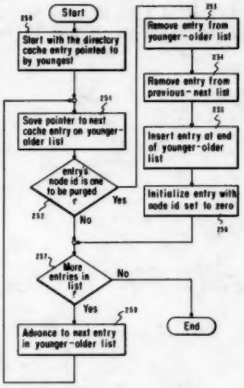
U.S. Cl. 395—600 **8 Claims**

1. A directory caching method for a network of data processing systems comprising:

saving, at a first system, a first unit of directory information about a second system in response to an inquiry by said first system regarding a directory structure of said second system;

automatically sensing a first notification from said second system to said first system in response to a subsequent change in said directory structure of said second system, wherein said first notification instructs said first system to erase said first unit of directory information;

detecting an inhibiting condition associated with said network of data processing systems, wherein said inhibiting condition is a saturation of second system process resources; and


Start
Start with the directory cache entry pointed to by youngest
Save pointer to next cache entry on younger-older list
entry's node id is one to be purged
Yes
No
Remove entry from younger-older list
Remove entry from previous-next list
Insert entry at end of younger-older list
Initialize entry with node id set to zero
More entries in list
No
Yes
Advance to next entry in younger-older list
End

automatically sending a second notification from said second system to said first system to erase said first unit of directory information in response to said inhibiting condition.

5,151,990

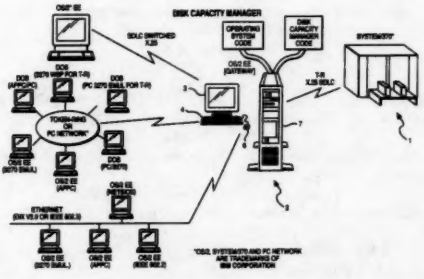
NONVOLATILE MEMORY MANAGEMENT IN A DATA PROCESSING NETWORK

James D. Allen, and Steven A. King, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 28, 1990, Ser. No. 573,745

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—650 **14 Claims**



1. A system for managing memory capacity in a data processing network connected to communicate data in specified protocol between multiple workstations with resident nonvolatile memory devices, comprising:

means for selectively querying a workstation connected on the network to determine the respective unused nonvolatile memory;

means for comparing the determined unused nonvolatile memory to a respective minimum capacity threshold value; and

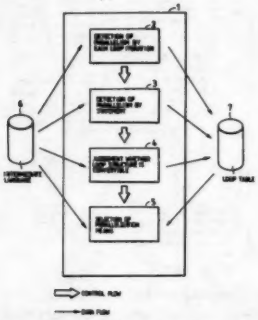
means for generating event response data in the network to signify that the unused nonvolatile memory at the queried workstation is below the threshold value.

5,151,991

PARALLELIZATION COMPILE METHOD AND SYSTEM

Kyoko Iwasawa, Tokyo; Yoshikazu Tanaka, Oomiya, and Shizuo Gotou, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 259,243
Claims priority, application Japan, Oct. 21, 1987, 62-263788
Int. Cl.[5] G06F *9/45*
U.S. Cl. 395—700 **17 Claims**



1. A parallelization method for compiling at least a part of a source program into object code representing processes executable in parallel, comprising steps executed by a data processor apparatus, the method comprising:

before converting the part of the source program into object code, estimating execution time each required for execution of one group of parallel processes within groups of parallel processes which groups will be respectively obtained by application of a plurality of predetermined parallelization conversions to the part of the source program;

selecting one of the predetermined plurality of parallelization conversions which produces one group of parallel processes having the shortest execution time among the estimate execution times;

applying the selected one parallelization conversion to the part of the source program; and,

converting a source program obtained by said applying step, into an object code representing the one group of parallel processes.

5,151,992

PERSONAL COMPUTER FOR CUTTING OFF POWER WHEN A LOCK MECHANISM OF HARD DISK PACK IS RELEASED

Akihito Nagae, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 1, 1990, Ser. No. 591,269
Claims priority, application Japan, Oct. 3, 1989, 1-258155
Int. Cl.[5] G06F *9/00, 1/00, 11/00*
U.S. Cl. 395—750 **8 Claims**

1. A computer system, comprising:

a power supply for supplying power to the computer system;

an external storage unit removably connected to said computer system;

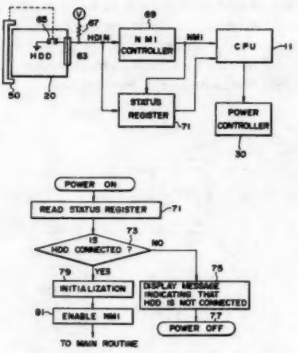
lock means for locking the external storage unit when it is attached to the computer system, and for releasing the external storage unit when it is removed from the computer system;

a switch turned on and off in response to the locking and releasing operations of the lock means, respectively;

specified signal generating means for outputting a specified signal in response to a state change of the switch means;

storage means for storing the attachment or detachment state of the external storage unit; and

control means, connected to the power supply and the specified signal generating means, for cutting off the power



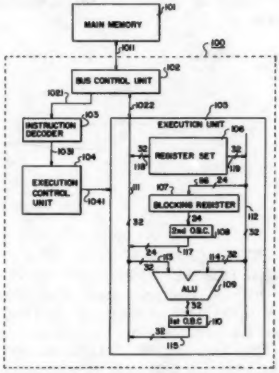
from the power supply supplied to the computer system in response to the specified signal.

5,151,993

DATA PROCESSOR PERFORMING OPERATION ON DATA HAVING LENGTH SHORTER THAN ONE-WORD LENGTH

Hitoshi Yamahata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 10, 1989, Ser. No. 321,399
Claims priority, application Japan, Mar. 10, 1988, 63-56808
Int. Cl.[5] G06F *9/30*
U.S. Cl. 395—775 **10 Claims**



1. A data processor for processing operand data and updating one portion of a destination area with processed data while maintaining data stored in a remaining portion of said destination area, said data processor comprising:

an operation unit for processing data supplied thereto,

storage means for temporarily storing data supplied thereto,

register means having said destination area, means for supplying said operand data to said operation unit,

means coupled to said register means for supplying said storage means with data of said destination area including said data stored in said remaining portion of said destination area simultaneously with said operand data being supplied to said operation unit, said operation unit producing said processed data in response to said operand data,

a data bus,

first transfer means coupled between said operation unit and said data but for transferring onto one portion of said data bus one portion of said processed data corresponding to said one portion of said destination area,

second transfer means coupled between said storage means and said data bus for transferring onto a remaining portion of said data bus data stored in said storage means corresponding to said remaining portion of said destination area simultaneously with said first transfer means transferring said one portion of said processed data, and

means for writing data on said data bus into said destination area.

5,151,994

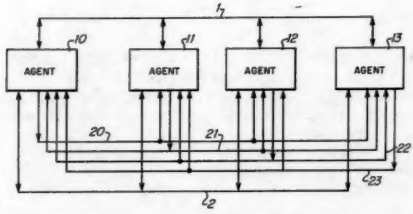
DISTRIBUTED FAIR ARBITRATION SYSTEM USING SEPARATE GRANT AND REQUEST LINES FOR PROVIDING ACCESS TO DATA COMMUNICATION BUS

Ross M. Wille, Sunnyvale, and Richard J. Carter, Palo Alto, both of Calif., assignors to Hewlett Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 436,144, Nov. 13, 1989, abandoned. This application Oct. 22, 1991, Ser. No. 780,578

Int. Cl.[5] G06F *9/46, 13/368*

U.S. Cl. 395—800 **16 Claims**



1. A method in a computing system for arbitrating access to a bus by a plurality of agents, the method comprising the steps of:

(a) maintaining a distributed priority access list in which each agent in the plurality of agents has a higher priority register which indicates the agent's relative priority level for obtaining access to the bus;

(b) when more than one agent from the plurality of agents requests access to the bus, obtaining bus access by an agent from among the agents requesting access which is highest on the distributed priority access list, including the following substeps

(b.1) signaling, by each agent requesting access to the bus, a request on a plurality of request lines, each of the plurality of request lines being coupled to each of the plurality of agents, and

(b.2) signaling on grant lines, by the agent from among the agents requesting access which is highest on the distributed priority access list, the identity of the agent from among the agents requesting access which is highest on the distributed priority access list, each of the grant lines being coupled to each of the plurality of agents and being separate from the request lines; and,

(c) once an agent from the plurality of agents has gained access to the bus, modifying each higher priority register to move the agent which gained access to the bottom of the distributed priority access list, wherein only the agent which gained access is moved lower on the distributed priority access list.

5,151,995

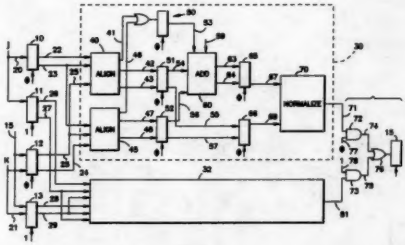
METHOD AND APPARATUS FOR PRODUCING SUCCESSIVE CALCULATED RESULTS IN A HIGH-SPEED COMPUTER FUNCTIONAL UNIT USING LOW-SPEED VLSI COMPONENTS

Susan J. Garcia, Eau Claire, Wis., assignor to Cray Research, Inc., Eagan, Minn.

Continuation of Ser. No. 478,758, Feb. 12, 1990, abandoned, which is a continuation of Ser. No. 229,136, Aug. 5, 1988, abandoned. This application Nov. 28, 1990, Ser. No. 622,325

Int. Cl.[5] G06F *15/16, 1/06*

U.S. Cl. 395—800 **1 Claim**



1. A multipath functional unit for a computer operative for producing successive calculated results at the frequency of the system clock of the computer, comprising:

a system clock having a fixed frequency and having a single phase;

n path clocks each having a frequency which is equal to the frequency of the system clock of the computer divided by n and each path clock having a different phase;

n substantially identical data processing paths within a single functional unit for performing operations on operands applied thereto, wherein each data processing path comprises:

at least one purely combinational logic block having a propogation delay greater than the period of the system clock;

at least one input data latch connected to said purely combinational logic block and which is clocked by one of said path clocks;

at least on output data latch connected to said purely combinational logic block and which is clocked by the same path clock which clocks said input data latch;

data input means connected to the input data latch of each of said n plurality of substantially identical data processing paths for receiving operands at the frequency of the system clock;

data output means connected to the output data latch of each of said plurality of substantially identical data processing paths for producing results at the frequency of the system clock; and

each of said plurality of substantially identical data processing paths being clocked by a different path clock so as to send successive operands to different ones of said plurality of substantially identical data processing paths.

5,151,996

MULTI-DIMENSIONAL MESSAGE TRANSFER ROUTER

W. Daniel Hillis, Brookline, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

Division of Ser. No. 478,082, Feb. 9, 1990, which is a division of Ser. No. 184,739, Jun. 27, 1988, Pat. No. 5,088,815, which is a continuation of Ser. No. 499,474, May 31, 1983, Pat. No. 4,814,973. This application Mar. 20, 1990, Ser. No. 497,003

Int. Cl.[5] G06F *15/16*

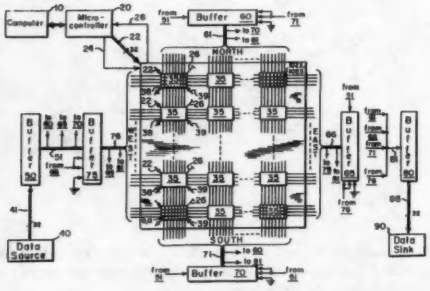
U.S. Cl. 395—800 **14 Claims**

1. A router comprising a plurality of routing nodes (180, 200)

interconnected by a plurality of communications links (38, 39) in a multi-dimensional pattern for transferring messages (FIG. 4), each message including an address including a series of address digits each associated with one of the series of dimensions, each router node including:

A a plurality of message input circuits (405) each connected to one of said communications links of a selected dimension for receiving messages from another router node over that dimension;

B a plurality of message output circuits (415) each connected to one of said communications links of a selected dimension for transmitting messages to another route node over that dimension;



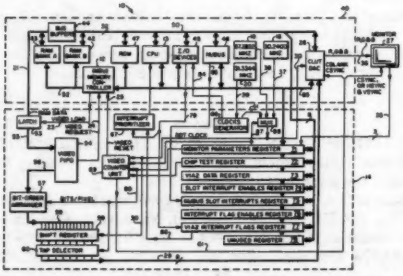
C a switch circuit (collection of cells 400) for selectively coupling messages from said input circuits to said output circuits in accordance wit the address, said switch circuit including a series of message coupling circuits (cells 400) each associated with a dimension, each message coupling circuit being connected to the message output circuit of the associated dimension, the message input circuit of a preceding dimension and to the message coupling circuits of proximate dimensions, said message coupling circuits selectively coupling a message at the message input circuit to either the message output circuit or the message coupling circuit of a proximate dimension in response to the condition of the address digit associated with the dimension.

5,151,997

COMPUTER WITH ADAPTABLE VIDEO CIRCUITRY

Robert L. Bailey, San Jose, and Brian D. Howard, Menlo Park, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Aug. 10, 1989, Ser. No. 392,094
Int. Cl.[5] G06F 7/00
U.S. Cl. 395—800 **19 Claims**



1. A computer which provides a video signal adaptable to different types of displays, said computer comprising:

a single central processing unit (CPU) which executes a program to provide video data for a given display;

a random-access memory (RAM) coupled to said CPU, a portion of said RAM storing said video data, wherein said RAM comprises a first bank and a second bank;

a video circuit coupled to said RAM for providing N bits of said video data per pixel to said given display at a predetermined rate, said video circuit sharing access to said RAM with said CPU, said video circuit comprises a first-in-first-out memory (FIFO) for temporarily storing said video data and a shift register coupled to said FIFO, said FIFO being divided into first and second halves, each half alternately receiving said video data from said first bank of said RAM and then loading previously received video data into said shift register, said shift register transferring N bits of said previously received video data per pixel to said given display at said predetermined rate;

a memory controller means for arbitrating access to said RAM by said CPU and said video circuit, said memory controller means assigning accesses to said RAM depending upon the particular video demands of said given display in a manner which optimizes the efficiency of said RAM, wherein said CPU is denied access to said RAM whenever said video circuit accesses said RAM;

a buffer means controlled by said memory controller means for decoupling said CPU from said first bank whenever said video circuit is accessing said first bank, said CPU retaining access to said second bank whenever said CPU is decoupled from said first bank;

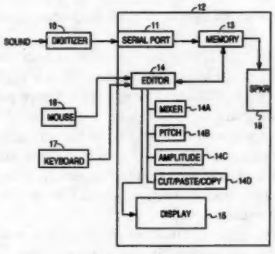
wherein said CPU, RAM, video circuit, memory controller means, and buffer means are housed on a single electronic circuit board.

5,151,998

SOUND EDITING SYSTEM USING CONTROL LINE FOR ALTERING SPECIFIED CHARACTERISTIC OF ADJACENT SEGMENT OF THE STORED WAVEFORM

Stephen P. Capps, San Carlos, Calif., assignor to Macromedia, Inc., San Francisco, Calif.

Filed Dec. 30, 1988, Ser. No. 292,299
Int. Cl.[5] G11B 27/28, 27/02, 7/36
U.S. Cl. 395—800 **35 Claims**



1. A device for editing sounds comprising:

means for storing a sound waveform;

means for visually displaying the stored waveform;

means for editing the appearance of a predetermined portion of the visually displayed waveform by manipulation of said visually displayed waveform; and

means for changing the sound waveform stored in the means for storing in accordance with changes made in the visually displayed waveform by the means for editing;

wherein the means for storing stores a digital representation of the waveform, and the means for displaying displays an analog representation of the waveform; and

wherein the means for displaying comprises a display displaying the amplitude of the waveform along a first associated axis and time along a second associated axis;

and wherein the means for editing comprises:

means for displaying a sound characteristics control line adjacent to the displayed waveform; and

means for displacing at least one segment of the sound characteristics control line adjacent to the portion of the displayed waveform;

wherein the means for editing comprises means for altering a specified characteristic of a portion of the stored waveform corresponding to the portion of the displayed waveform adjacent to the displaced line segment.

5,151,999

SERIAL COMMUNICATIONS CONTROLLER FOR TRANSFER OF SUCCESSIVE DATA FRAMES WITH STORAGE OF SUPPLEMENTAL DATA AND WORD COUNTS

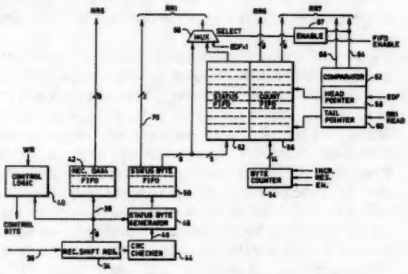
Teresa Marzucco, Waltham, Mass.; John Korpusik, Hudson, N.H., and Patricia A. Martin, Westford, Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Continuation of Ser. No. 846,337, Mar. 31, 1986, Pat. No. 4,942,515. This application Nov. 3, 1989, Ser. No. 431,607

The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—800 **15 Claims**



1. Input/output (I/O) control circuitry for a data communication system for receiving sequential frames of incoming data words and transferring said data words to memory which is separate from said I/O control circuitry, said I/O control circuitry comprising:

means for generating supplemental data to be read from said I/O control circuitry, supplemental data being information which is different from but is associated with each frame of incoming data;

means for counting the number of words within each frame to provide a word count; and

means, coupled to the means for generating and the means for counting, for storing said supplemental data and associated word counts with continued transfer of sequential frames of data to said memory, storage capacity in said I/O control circuitry for frames of data being limited such that successive frames of data are not stored in said I/O control circuitry but said supplemental data and word counts are stored and are available to be read from said I/O control circuitry after transfer of frames with which the supplemental data is associated.

5,152,000

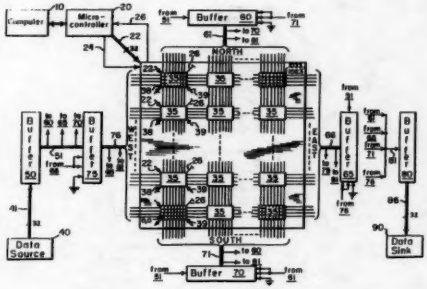
ARRAY COMMUNICATIONS ARRANGEMENT FOR PARALLEL PROCESSOR

Daniel W. Hillis, Brookline, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

Division of Ser. No. 184,739, Jun. 27, 1988, Pat. No. 5,008,815, which is a continuation of Ser. No. 499,474, May 31, 1983, Pat. No. 4,814,973. This application Feb. 9, 1990, Ser. No. 478,082

Int. Cl.[5] G06F *15/80*

U.S. Cl. 395—800 **10 Claims**



1. A parallel computer comprising:

A. a plurality of integrated circuit chips (35) for connection in a chip array, each chip comprising:

i. a plurality of processors (36) each including data generation means (280, 287) for generating data and data receiving means (290) for receiving data in parallel during a data transfer operation,

ii. a plurality of on-chip links for interconnecting the processors on each chip to form a processor array on said chip to facilitate the transfer of data generated by said processors in unison along selected directions in said processor array during a data transfer operation;

iii. a plurality of sets of selectively-energizable data transfer terminals (104 and 117, 110 and 118, 106 and 119), each set of data transfer terminals facilitating the transfer of data transmitted by the processors along an edge of the processor array defined on the chip, between chips along a selected direction in the chip array during a data transfer operation, at least one set of data transfer terminals (106) selectively facilitating the transfer of data from processors along at least two edges of the processor array defined on the chip in corresponding non-collinear directions in the chip array;

B. a plurality of communications links (102) connected between sets of data transfer terminals of respective chips to interconnect said chips to form the chip array, the communications link that is connected to the one set of data transfer terminals (106) of each chip being connected to sets of data transfer terminal (specifically, 104 and 110) of each of at least two other chips along at least two non-collinear directions in said chip array to selectively facilitate the transfer of data therethrough with the at least two other chips that are connected thereto so that separate data transfer terminals are not required to accommodate data transfer operations along the two non-collinear directions by the processing elements along the respective two edges of the array; and

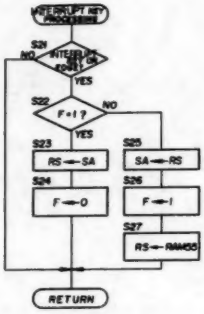
C. a control circuit for controlling the processors and selectively energizing the data transfer terminals of said integrated circuit chips in unison to facilitate the transfer of data in parallel by all processors along a selected direction in said processor array and said chip array during a data transfer operation.

5,152,001

COPYING APPARATUS THAT AUTOMATICALLY SETS MANUALLY INPUTTED CONDITIONS OF IMMEDIATELY PRECEDING INTERRUPT AS INITIAL COPY CONDITION FOR PRESENT INTERRUPT

Hiroyuki Hanamoto, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 110,412, Oct. 20, 1987, abandoned.
This application Jun. 25, 1990, Ser. No. 542,643
Claims priority, application Japan, Oct. 21, 1986, 61-251093
Int. Cl.[5] G06F *13/24*; G03G *15/00*
U.S. Cl. 395—800 5 Claims



1. A copying apparatus having an interrupt copying function for performing an interrupt copying operation by interrupting a normal copying operation, comprising:

input means for manually inputting copying conditions;

first memory means for storing said copying conditions inputted by said input means;

copying control means for performing the normal copying operation and the interrupt copying operation according to the copying conditions stored in the first memory means;

mode switching means for switching between a normal copying mode in which the normal copying operation is performed by said copying control means and an interrupt copying mode in which the interrupt copying operation is performed by said copying control means;

second memory means for temporarily saving the copying conditions of the normal copying operation interrupted by the interrupt copying operation;

third memory means for storing the copying conditions, including manually inputted copying conditions, of an immediately preceding interrupt copying operation performed by the copying control means;

means for temporarily saving in said second memory means, when the normal copying mode is switched to the interrupt copying mode by said mode switching means, the copying conditions stored in said first memory means, and for initially setting up in the first memory mean the copying conditions of the immediately preceding interrupt copying operation which are stored in said third memory means; and

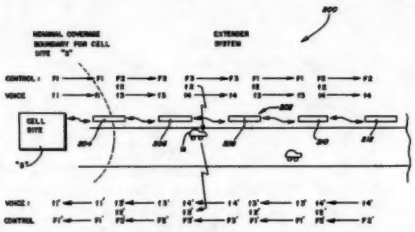
means for saving in the third memory means, when the interrupt copying mode is switched to the normal copying mode by said mode switching means, the copying conditions, including manually inputted copying conditions, stored in said first memory means, and for setting up the copying conditions stored in said second memory means in said first memory means, whereby copying conditions in a preceding interrupt copying mode are initially set in the first memory means when the interrupt copying mode is selected by the mode switching means.

5,152,002

SYSTEM AND METHOD FOR EXTENDING CELL SITE COVERAGE

Samuel A. Leslie, Forest, and Robert T. Gordon, Lynchburg, both of Va., assignors to Orion Industries, Inc., Solon, Ohio

Division of Ser. No. 81,120, Aug. 3, 1987, Pat. No. 4,941,200.
This application Feb. 13, 1990, Ser. No. 479,511
Int. Cl.[5] H04B *7/14, 7/15*
U.S. Cl. 455—11.1 4 Claims



1. An apparatus for extending a primary coverage area of a cell site transceiver in a cellular radio telephone system so that a movable cellular transceiver in communication with the cell site can move out of the primary coverage area into an extended area while continuing to remain in communication with the cell site transceiver, wherein the primary coverage area consists of the intended coverage area of the cell site transceiver, the apparatus comprising:

a first bidirectional cellular booster in radio frequency communication with the cell site transceiver and with a booster coverage area that overlaps the primary coverage area only in part with said booster including means for communicating with a movable transceiver in said booster coverage area but outside of the primary coverage area of the cell site transceiver;

a plurality of series coupled, substantially identical cellular boosters with each said booster having a respective coverage area outside of the primary coverage area and overlapping a said coverage area of at least one adjacent member of said plurality with each member of said plurality including means for communicating with the movable transceiver in said respective booster coverage area and outside of the primary coverage area of the cell site transceiver as well as means for transferring the movable transceiver from one booster in said plurality to an adjacent booster in said plurality in response to the movable transceiver moving from said coverage area of said one booster into said coverage area of said adjacent booster; and

with a selected member of said plurality having a booster coverage area that overlaps, at least in part, said coverage area of said first bidirectional booster.

5,152,003

RECORD MESSAGE DELIVERY SYSTEM

Neil Poch, Toronto, Canada, assignor to Tour-Mate Systems Canada Limited, Toronto, Canada

Continuation of Ser. No. 422,812, Oct. 18, 1989, abandoned.
This application Nov. 22, 1991, Ser. No. 799,731
Int. Cl.[5] H04B *1/10*
U.S. Cl. 455—18 11 Claims

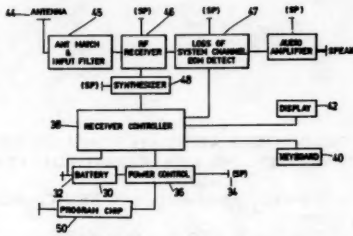
1. A system for the delivery of pre-recorded messages in response to selection by a listener, comprising:

recorded messages stored in a computer memory, each message being present in a plurality of languages, and each message irrespective of its language being associated with a message identification datum;

a transmitter settable to transmit each message on separate non-interfering frequencies in a locality cell, each of the

messages in different languages being transmitted on separate non-interfering frequencies in each locality cell;

at least one receiver, each receiver including a programmable and reprogrammable computer microchip and having a plurality of receiving channels each for reception of a particular frequency, the receiver being programmable and reprogrammable for reception of particular frequencies associated with any messages in a chosen one of the languages; and



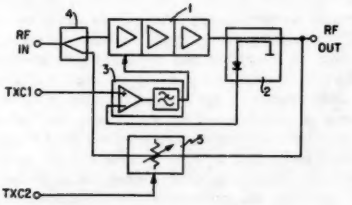
manually operable selection means to select a particular reception channel in accordance with a message identification datum, thereby to receive in the chosen language the message associated with the message identification datum.

5,152,004

PROCEDURE FOR FORMING LOW POWER LEVELS IN A RADIO TELEPHONE TRANSMITTER

Risto Väisänen; Jukka Sarasmo, and Vesa Pekkarinen, all of Salo, Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland

Filed Apr. 30, 1990, Ser. No. 516,762
Claims priority, application Finland, May 12, 1989, 892314
Int. Cl.[5] H04B *1/04*
U.S. Cl. 455—68 **11 Claims**



1. A circuit for forming lower power levels in a transmitter of a radio telephone, in which a radio frequency signal (RF signal) is conducted through an amplifier stage to an output of the transmitter, comprising:

a source divider for dividing the RF signal which is before the amplifier stage (1) into two branches;

means for forming high power levels by conducting in one of the branches the RF signal into said amplifier stage (1) by which the high power levels are formed;

means for forming low power levels by conducting in the other of the branches the RF signal to an element (b) by which the low power levels are produced; and

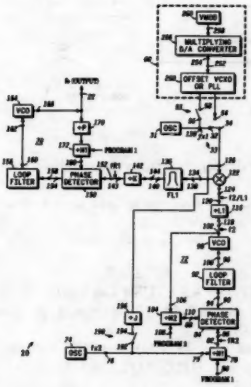
means for combining said branches in the output (RFout) of the transmitter, the high power levels each having a magnitude greater than each of the low power levels, each of the means for forming high power levels and the means for forming low power levels receiving respective control signals derived from control logic of the radio telephone so as to allow the means for forming low power levels to conduct the RF signal to the element and thereby bypass the amplifier stage when low power levels are desired and so as to allow the means for forming high power levels to conduct the RF signal into the amplifier stage when high power levels are desired.

5,152,005

HIGH RESOLUTION FREQUENCY SYNTHESIS

Robert H. Bickley, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 468,440, Jan. 22, 1990, abandoned. This application Oct. 15, 1991, Ser. No. 774,173
Int. Cl.[5] H04B *1/40, 17/02*; H03L *7/00*
U.S. Cl. 455—76 **37 Claims**



26. A frequency synthesizer of output frequency Fo, comprising:

means for receiving a first signal of a first frequency;

means for receiving a second signal of a second frequency and generating therefrom another frequency proportional to the second frequency divided by a first number;

first circuit means for receiving the another frequency and providing a third frequency proportional to a product of the another frequency by a second number;

second circuit means for combining the first and third frequencies to provide a fourth frequency proportional to a sum of the first and third frequencies; and

third circuit means for receiving the fourth frequency and providing output frequency Fo which is proportional to a product of the fourth frequency times the first number.

5,152,006

RECEIVER CONTROLLER METHOD AND APPARATUS

Thomas R. Klaus, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 25, 1991, Ser. No. 660,195
Int. Cl.[5] H04B *1/38, 1/16*
U.S. Cl. 455—89 **8 Claims**

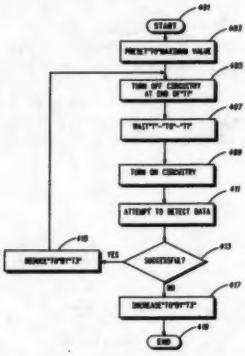
1. A method of adaptively controlling a radio receiver's on-time, the receiver circuitry including a data detector, a mixer and a frequency synthesizer, and receiving a first of a plurality of radio frequency signals, the radio frequency signals being received for a first predetermined time period at intervals of a second predetermined time period, the method comprising the steps of:

setting a first time parameter to a third predetermined time period;

turning off the radio receiver at the end of the first time period;

subtracting the sum of the magnitude of the first predetermined time period and the magnitude of said first time

parameter from the magnitude of the second predetermined time period, forming a second time parameter;
waiting a length of time equal to said second time parameter;
turning on the radio receiver circuitry;



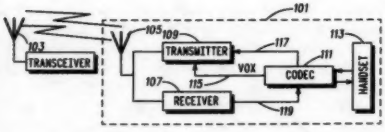
attempting to detect data from the received radio frequency signals; and
increasing said first time parameter by a fourth time period when data is not detected.

5,152,007

METHOD AND APPARATUS FOR DETECTING SPEECH

Juan R. Uribe, Brookfield, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 23, 1991, Ser. No. 690,033
Int. Cl.[5] H01Q *11/12*; H04M *11/04*
U.S. Cl. 455—116 **7 Claims**



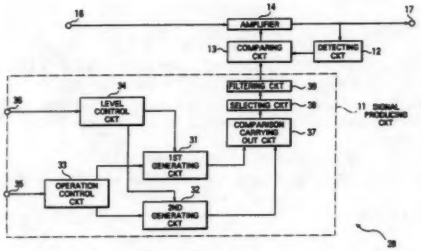
1. A method of generating a first signal representing the detection of speech on a second signal having background noise, a magnitude, a zero crossing rate and is divided in time by frames having a predetermined time period, the method comprising the steps of:
characterizing, in absence of speech, the background noise of the second signal comprising the steps of:
computing an average of the magnitude of the second signal for a second predetermined number of frames, and
computing an average of the zero crossing rate of the second signal for said second predetermined number of frames;
computing background noise magnitude and zero crossing rate thresholds for the second signal;
computing an average of the magnitude of the second signal for a first frame;
computing a zero crossing rate of the second signal for said first frame;
comparing said average of the magnitude of the second signal to said background noise magnitude threshold;
comparing said zero crossing rate of the second signal to said background noise zero crossing rate threshold; and
generating, upon said average of the magnitude or said zero crossing rate consecutively exceeding said background noise threshold a first predetermined number of frames, the first signal.

5,152,008

SIGNAL CONTROL APPARATUS CAPABLE OF READILY CHANGING AN APPARATUS OUTPUT SIGNAL

Tsuguo Hori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 30, 1991, Ser. No. 648,689
Claims priority, application Japan, Jan. 30, 1990, 2-17718; Jan. 30, 1990, 2-20324
Int. Cl.[5] H04B *1/04*
U.S. Cl. 455—127 **5 Claims**



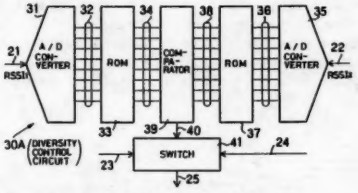
2. A signal control apparatus for controlling an apparatus input signal to produce an apparatus output signal, including signal producing means for producing a reference signal, detecting means for detecting said apparatus output signal to produce an output waveform signal representative of a waveform of said apparatus output signal, comparing means for comparing said output waveform signal with said reference signal to produce a difference signal representative of a difference between said output waveform signal and said reference signal, and signal processing means for processing said apparatus input signal into said apparatus output signal under control of said difference signal, wherein said signal producing means comprises:
signal generating means for generating a plurality of original waveform signals which have signal levels, respectively;
internal producing means connected to said generating means for producing said reference signal in accordance with a selected one of said original waveform signals, said internal producing means comprising:
comparison carrying out means connected to said signal generating means for carrying out comparison among said signal levels to produce a result signal representative of said comparison;
selecting means connected to said comparison carrying out means for selecting, as a selected signal, one of said original waveform signals with reference to said result signal; and
internal processing means connected to said selecting and said comparing means for processing said selected signal into said reference signal.

5,152,009

DIVERSITY RECEPTION CONTROL CIRCUIT

Kazuyoshi Sato, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1989, Ser. No. 458,522
Claims priority, application Japan, Aug. 8, 1989, 1-205253
Int. Cl.[5] H04B *17/02, 17/00, 7/00*
U.S. Cl. 455—134 17 Claims



1. A diversity control circuit comprising:

a plurality of antennas positioned at a distance apart from each other so as to be exposed to different receiving electric field strengths of a transmitted signal;

a plurality of measuring systems each connected to one of said antennas for measuring the receiving electric field strength of each of said antennas and providing measuring signals to permit selection of the antenna positioned in the strongest receiving electric strength location;

said measuring systems including receiving systems for demodulating and detecting radio signals received by said antennas to provide said measuring signals;

correction means connected to at least one of said measuring systems for modifying the response thereof and providing a corrected response whereby the output signal of said at least one measuring system is corrected to conform to a preselected relationship relative to the input thereof over an operating range of input signal levels;

said correction means including A/D conversion means for converting said measuring signals into digital values and memory means storing correction data and having address inputs connected to respond to said digital values of said measuring signals;

comparison means for comparing the relative levels of the outputs of said measuring systems; and

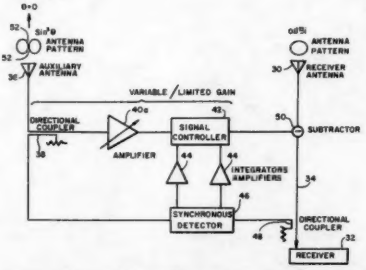
switching means responsive to said comparison means for making electrical connection to the antenna determined by said comparison means to be in the strongest receiving electric strength location.

5,152,010

HIGHLY DIRECTIVE RADIO RECEIVER EMPLOYING RELATIVELY SMALL ANTENNAS

Ashok K. Talwar, Westlake Village, Calif., assignor to American Nucleonics Corporation, West Lake Village, Calif.

Filed Dec. 29, 1989, Ser. No. 458,842
Int. Cl.[5] H04B *17/02, 7/00*
U.S. Cl. 455—136 5 Claims



1. A narrow beamwidth radio receiver, which comprises:

a receiver antenna, the receiver antenna being of the omnidirectional type;

a receiver;

a receiver transmission line electrically coupling the receiver antenna to the receiver;

an auxiliary antenna, the auxiliary antenna having at least one null in the auxiliary antenna pattern;

a first directional coupler electrically coupled to the auxiliary antenna;

a second directional coupler electrically coupled to the receiver transmission line;

a synchronous detector electrically coupled to the first and second directional couplers, the first directional coupler providing a portion of a reference signal to the synchronous detector, and the second directional coupler providing a sample signal to the synchronous detector, the synchronous detector comparing the reference signal with the sample signal and providing at least one detector output signal in response to the comparison thereof;

at least one integrator/amplifier, the integrator/amplifier providing a control signal in response to the detector output signal;

variable amplification means, the variable amplification means being electrically coupled to the first directional coupler and providing a variably amplified reference signal in response to the reference signal provided by the first directional coupler;

a signal controller, the signal controller being electrically coupled to the variable amplification means and to the integrator/amplifier and providing a cancellation signal in response to the amplified reference signal and the control signal; and

a subtractor, the subtractor being electrically coupled to the signal controller and to the receiver transmission line and effectively injecting the cancellation signal into the receiver transmission line for reducing the power of any signals received outside of a predetermined angle from the center of the null of the auxiliary antenna to effectively provide the radio receiver with a narrow beamwidth;

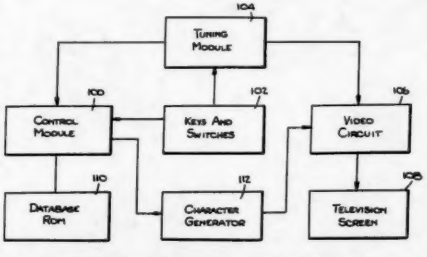
the variable amplification means being adjustable in gain to vary and control the effective beamwidth of the radio receiver.

5,152,011

BROADCAST RECEIVER CAPABLE OF AUTOMATIC STATION IDENTIFICATION AND FORMAT-SCANNING BASED ON AN INTERNAL DATABASE UPDATABLE VIA DATA RECEPTION OVER THE AIRWAVES

Pierre R. Schwob, 257 Central Park W., New York, N.Y. 10024-4108

Continuation-in-part of Ser. No. 515,629, Apr. 27, 1990, which is a continuation-in-part of Ser. No. 212,863, Jun. 29, 1988, Pat. No. 4,969,209, which is a continuation-in-part of Ser. No. 78,286, Jul. 27, 1987. This application Jun. 19, 1990, Ser. No. 540,130
Int. Cl.[5] H04B *1/08*
U.S. Cl. 455—158.5 10 Claims



1. A broadcast receiver system comprising:

a receiver for receiving a plurality of frequencies broadcast from a plurality of geographic regions;

tuning means for tuning said receiver to one of the plurality of broadcast frequencies for reception thereof;

memory means for storing a database of information in one or more band files relating to frequencies broadcast into each of the plurality of geographic regions, said information including data identifying attributes of each frequency broadcast into each geographic region;

input means for inputting a geographic region corresponding to a location of said broadcast receiver system and a datum representing a desired attribute;

searching means responsive to the inputted geographic region and the inputted datum representing the desired attribute for searching said one or more band files for a frequency broadcast into the geographic region of said broadcast receiver system having the desired attribute;

display means for displaying the frequency and the desired attribute for the broadcast frequency identified by said searching means; and

data receiving means for receiving updating data to update said database in said memory means.

5,152,012

BROADCAST RECEIVER CAPABLE OF AUTOMATICALLY UPDATING LOCATION AND PERFORMING SPIRAL SEARCHING

Pierre R. Schwob, 257 Central Park West, New York, N.Y. 10024-4108

Continuation-in-part of Ser. No. 212,863, Jun. 29, 1988, Pat. No. 4,969,209, which is a continuation-in-part of Ser. No. 078,286, Jul. 27, 1987, abandoned. This application Apr. 27, 1990, Ser. No. 515,629

Int. Cl.[5] H04B *1/16*

U.S. Cl. 455—158.5 **20 Claims**

1. A broadcast receiver system comprising:

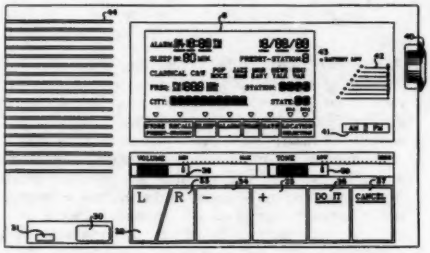
a receiver for receiving a plurality of frequencies broadcast from a plurality of geographic regions;

tuning means for tuning said receiver to one of the plurality of broadcast frequencies for reception thereof;

memory means for storing a database of information in one or more band files relating to frequencies broadcast into each of the plurality of geographic regions, said information including data identifying attributes of each frequency broadcast into each geographic region;

input means for inputting a geographic region corresponding to a location of said broadcast receiver system and a datum representing a desired attribute;

searching means responsive to the inputted geographic region and desired attribute for searching said one or more band files for frequencies broadcast into the geographic



region of said broadcast receiver system having the desired attribute; and

display means for displaying the frequency and the attribute data for a broadcast frequency identified by said searching means.

DESIGN PATENTS

GRANTED September 29, 1992

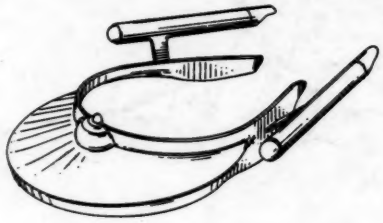
ERRATA

For CLASS	See PATENT NO.
D21-220	329,904
D21-220	9905
D21-219	9906
D22-141	9907
D22-142	9908
D22-142	9909
D23-215	9910
D23-250	9911
D23252	329,912

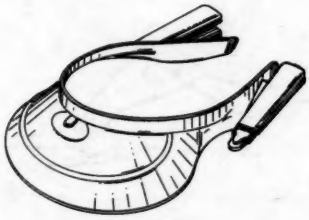
DESIGNS

SEPTEMBER 29, 1992

329,729
VISOR
Robert E. Coyle, 542 E. Broadway, Mesa, Ariz. 85204
Filed Nov. 23, 1990, Ser. No. 617,540
Term of patent 14 years
U.S. Cl. D2—248



329,730
VISOR
Robert E. Coyle, 542 E. Broadway, Mesa, Ariz. 85204
Filed Nov. 23, 1990, Ser. No. 617,541
Term of patent 14 years
U.S. Cl. D2—248



329,731
SANDAL
Bob E. Adcock, 20564 Exbury Pl., Covina, Calif. 91723, and Edwin C. Laird, 9660 Rindge Cir., Fountain Valley, Calif. 92708
Filed Aug. 29, 1990, Ser. No. 574,256
Term of patent 14 years
U.S. Cl. D2—270

329,732
HEEL CUP
John L. Molet, 1940 Phillips, Northglenn, Colo. 80233; Andrew J. Harrison, deceased, late of Denver, and by Sara L. Harrison, legal representative, 3601 Monroe St., Denver, Colo. 80205
Filed Sep. 27, 1990, Ser. No. 589,192
Term of patent 14 years
U.S. Cl. D2—277

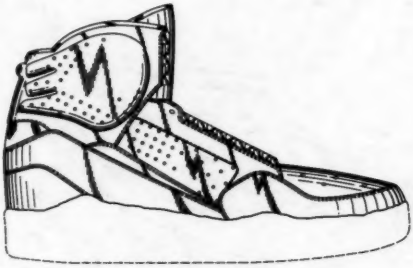
329,733
TONGUE ELEMENT OF A SHOE UPPER
David E. Miller, Carver; Paul D. Brown, Hingham; Andrew R. Jones, Roslindale, and Eric D. Cohen, Boston, all of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Division of Ser. No. 370,291, Jun. 23, 1989, Pat. No. Des. 307,508. This application Dec. 11, 1989, Ser. No. 448,583
Term of patent 14 years
U.S. Cl. D2—314

329,734
SHOE UPPER
David J. Preskar, North Quincy, and Paul D. Brown, Hingham, both of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Jun. 11, 1991, Ser. No. 713,325
Term of patent 14 years
U.S. Cl. D2—314

329,735
SHOE UPPER
Janelle Dahlsten, Lake Oswego, Oreg., assignor to Avia Group International, Inc., Portland, Oreg.
Filed Dec. 4, 1991, Ser. No. 802,425
Term of patent 14 years
U.S. Cl. D2—314

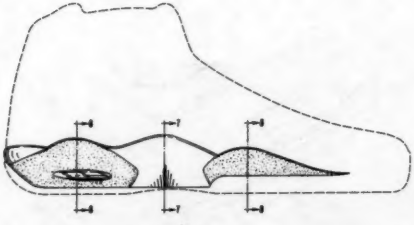
329,736
SHOE UPPER
Robert Byrne, Hermosa Beach, and James Agnew, Lakeview Terrace, both of Calif., assignors to L.A. Gear, Inc., Los Angeles, Calif.
Filed Oct. 7, 1991, Ser. No. 772,025
Term of patent 14 years
U.S. Cl. D2—314

329,737
SHOE UPPER
Brian Elliot, Portland, Oreg., assignor to Nike, Inc. and Nike International, Ltd., Beaverton, Oreg.
Filed Oct. 10, 1991, Ser. No. 774,278
Term of patent 14 years
U.S. Cl. D2—314



329,738
SHOE UPPER
Peter C. Keen, N. Andover, Mass., assignor to The Rockport Company, Inc., Marlboro, Mass.
Filed Dec. 19, 1991, Ser. No. 810,028
Term of patent 14 years
U.S. Cl. D2—314

329,739
SHOE MIDSOLE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Dec. 13, 1991, Ser. No. 806,463
Term of patent 14 years
U.S. Cl. D2—318



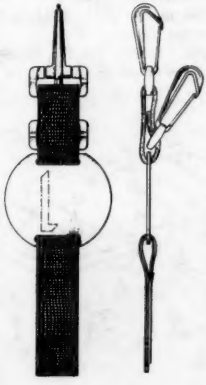
329,740
SHOE SOLE
Junichi Kiyosawa, Kobe, and Toshikazu Ujishima, Higashi-Osaka, both of Japan, assignors to Asics Corporation, Hyogo, Japan
Filed Sep. 11, 1990, Ser. No. 580,910
Claims priority, application Japan, Mar. 17, 1990, 2-9052
The portion of the term of this patent subsequent to Sep. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—320

329,741
SHOE SOLE
Junichi Kiyosawa, Kobe, Japan, assignor to Asics Corporation, Hyogo, Japan
Filed Dec. 21, 1990, Ser. No. 631,781
Claims priority, application Japan, Jul. 3, 1990, 2-22619
The portion of the term of this patent subsequent to Sep. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—320

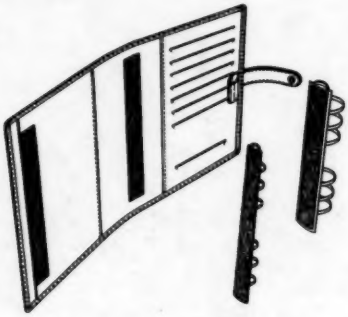
329,742
SHOE SOLE
Robert Byrne, Hermosa Beach, and James Agnew, Lakeview Terrace, both of Calif., assignors to L.A. Gear, Inc., Los Angeles, Calif.
Filed Oct. 7, 1991, Ser. No. 772,023
Term of patent 14 years
U.S. Cl. D2—320

329,743
SKI BAG
Keith D. Heisick, 2212 William Tell Rd., St. Paul, Minn. 55119
Filed Feb. 16, 1990, Ser. No. 480,530
Term of patent 14 years
U.S. Cl. D3—36

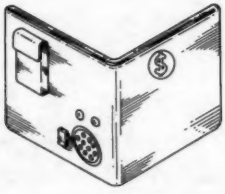
329,744
GOLF BAG TAG AND GLOVE HOLDER ATTACHMENT
Joseph A. Moore, Atlanta, Ga., assignor to Hang 5, Inc., Atlanta, Ga.
Filed Mar. 30, 1990, Ser. No. 502,025
Term of patent 14 years
U.S. Cl. D3—37



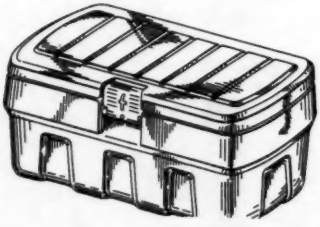
329,745
PERSONAL ORGANISER
Dermot C. O'Brien, 34 Roland Gardens, London SW7 3PL, England
Filed Feb. 1, 1990, Ser. No. 474,592
Claims priority, application United Kingdom, Aug. 9, 1989, 2000229
Term of patent 14 years
U.S. Cl. D3—56



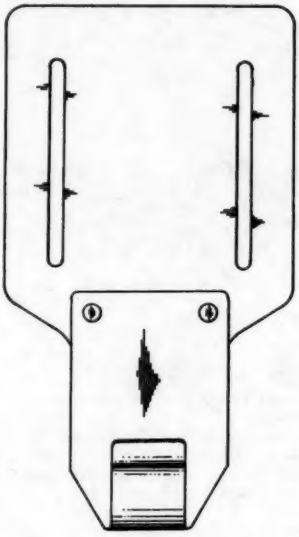
329,746
SECURE WALLET
Richard McGallaird, 6101 Whitby Rd., #1207, San Antonio, Tex. 78240
Filed Jul. 12, 1990, Ser. No. 551,606
Term of patent 14 years
U.S. Cl. D3—56



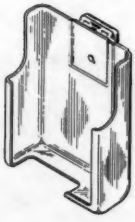
329,747
STORAGE LOCKER
Donald Embree, Uniontown, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 26, 1990, Ser. No. 558,841
Term of patent 14 years
U.S. Cl. D3—78



329,748
BELT ATTACHABLE TOOL HOLDER
Thomas O. Ehlin, 7138 Sanddollar St., Coos Bay, Oreg. 97420
Filed Jul. 30, 1990, Ser. No. 559,883
Term of patent 14 years
U.S. Cl. D3—105

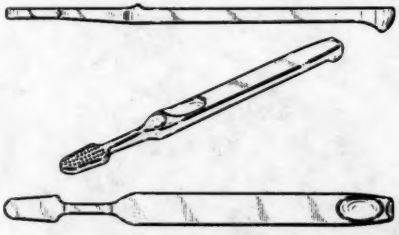


329,749
RADIO PAGER CARRYING CASE
William J. Scheid, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 27, 1990, Ser. No. 559,880
Term of patent 14 years
U.S. Cl. D3—106

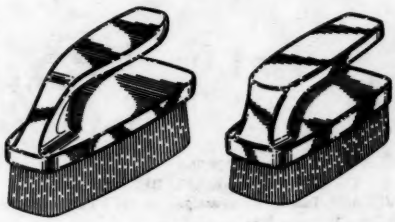


329,750
PAGER CARRYING CASE
John A. Gilmore, and Leslie C. Gilmore, both of 4934 S. Evanston St., Aurora, Colo. 80015
Filed Oct. 19, 1990, Ser. No. 600,234
Term of patent 14 years
U.S. Cl. D3—106

329,751
TOOTHBRUSH HEAD AND HANDLE UNIT
Anthony Booth, Chester; Anthony Piano, Sparta; Byron Woodrum, Flemington; Michael J. Allsop, West Windsor, all of N.J.; Robert L. Berger, New Hope, Pa., and Richard M. Hyman, Sr., Iowa City, Iowa, assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Apr. 24, 1990, Ser. No. 514,495
Term of patent 14 years
U.S. Cl. D4—104

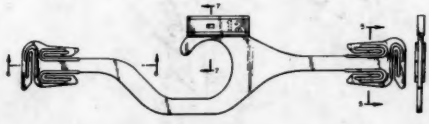


329,752
SCRUB BRUSH
Kent W. Murphy, Wooster, Ohio, and Joseph Lapin, Montreal, Canada, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 2, 1990, Ser. No. 548,725
Term of patent 14 years
U.S. Cl. D4—129

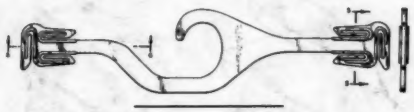


329,753
CHEVAL MIRROR
Frederick Delafield, 2406 Goldfield Ct., Greensboro, N.C. 27408
Filed Oct. 18, 1991, Ser. No. 779,564
Term of patent 14 years
U.S. Cl. D6—311

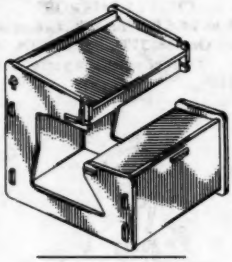
329,754
GARMENT HANGER
Stanley F. Gouldson, Northport, N.Y., and David Marshall, East Doncaster, Australia, assignors to Plasti-form Enterprises, Inc., Deer Park, N.Y.
Filed Sep. 14, 1990, Ser. No. 583,028
The portion of the term of this patent subsequent to Sep. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—326



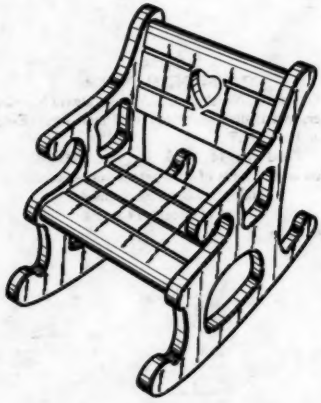
329,755
GARMENT HANGER
Stanley F. Gouldson, Northport, N.Y., assignor to Plasti-form Enterprises, Inc., Deer Park, N.Y.
Filed Sep. 14, 1990, Ser. No. 583,343
The portion of the term of this patent subsequent to Sep. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—326



329,756
COMBINED DESK AND BENCH UNIT
Paul J. Gandy, Tuscon, Ariz., assignor to MUPI Children Products Inc., Marana, Ariz.
Filed May 8, 1989, Ser. No. 349,331
Term of patent 14 years
U.S. Cl. D6—338

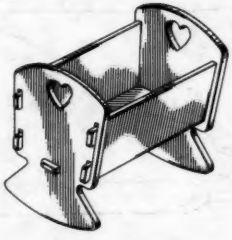


329,757
CHILD'S ROCKER
Paul K. Meeker, 113 W. Mennonite Rd., Aurora, Ohio 44202, assignor to Paul K. Meeker, Aurora, Ohio
Filed Oct. 16, 1989, Ser. No. 422,916
Term of patent 14 years
U.S. Cl. D6—348

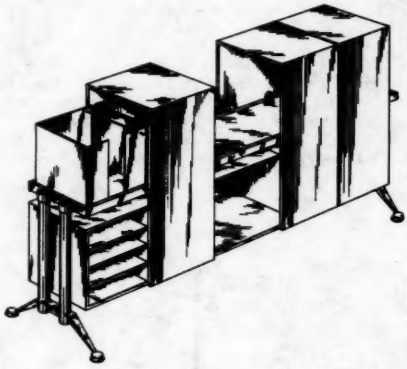


329,758
CHILD'S BENCH SEAT
Paul K. Meeker, Aurora, Ohio, assignor to Paul K. Meeker, Aurora, Ohio
Filed Oct. 16, 1989, Ser. No. 422,919
Term of patent 14 years
U.S. Cl. D6—381

329,759
CRIB
Paul J. Gandy, Tucson, Ariz., assignor to MUPi Children's Products, Tucson, Ariz.
Filed Nov. 13, 1989, Ser. No. 434,834
Term of patent 14 years
U.S. Cl. D6—385



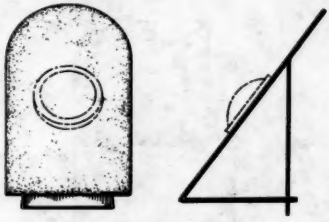
329,760
COMBINED STORAGE SHELF AND SLIDABLE CABINET UNIT
Urs Greutmann, and Carmen Greutmann, both of Zürich, Switzerland, assignors to Denz Design, Kempten, Switzerland
Filed Mar. 26, 1990, Ser. No. 499,826
Claims priority, application Switzerland, Sep. 25, 1989, 117,742
Term of patent 14 years
U.S. Cl. D6—397



329,761
SEAT ATTACHABLE UMBRELLA SUPPORT
Raymond J. Pieper, 1386 Reale Ave., St. Louis, Mo. 63138
Filed May 11, 1989, Ser. No. 350,327
Term of patent 14 years
U.S. Cl. D6—416

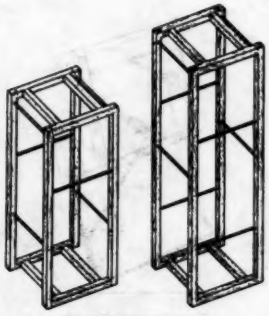
329,762
COPYHOLDER
Andrew J. Weeks, 137 Old Ford End Rd., Queens Park, Bedford MK40 4 NG, England
Filed May 30, 1989, Ser. No. 359,053
Claims priority, application United Kingdom, Dec. 1, 1988, 1055352
Term of patent 14 years
U.S. Cl. D6—419

329,763
JEWELRY DISPLAY STAND
Raymond J. Cuminale, New York, N.Y., assignor to Art Deco, Inc., Boca Raton, Fla.
Filed Jul. 25, 1990, Ser. No. 557,510
Term of patent 14 years
U.S. Cl. D6—429



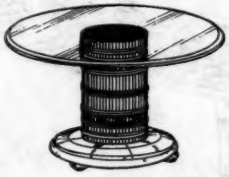
329,764
SHOE RACK
David Evans, Acton, Mass., assignor to Tucker Housewares, Inc., Leominster, Mass.
Division of Ser. No. 324,336, Mar. 16, 1989, Pat. No. D. 323,259. This application Aug. 26, 1991, Ser. No. 734,876
Term of patent 14 years
U.S. Cl. D6—462

329,765
HANGER BAR DISPLAY STAND
Robert Ackley, Brewerton, N.Y.; Stanleigh Wells, Bridgewater, Conn.; Robert Beehner, East Syracuse, and James Dokoupil, Liverpool, both of N.Y., assignors to The Croydon Company, Inc., Liverpool, N.Y.
Filed Oct. 30, 1990, Ser. No. 605,479
Term of patent 14 years
U.S. Cl. D6—465



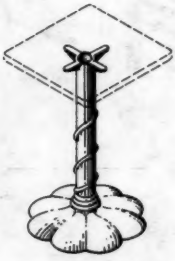
329,766
STORAGE UNIT FOR TOOLS
Bruce Ancona, and Jane Ancona, both of New York City, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Feb. 28, 1990, Ser. No. 486,716
Term of patent 14 years
U.S. Cl. D6—467

329,767
TABLE
Winsor D. White, Chicago, Ill., assignor to Henredon Furniture Industries, Inc., Morganton, N.C.
Filed Jun. 29, 1989, Ser. No. 374,390
Term of patent 14 years
U.S. Cl. D6—486

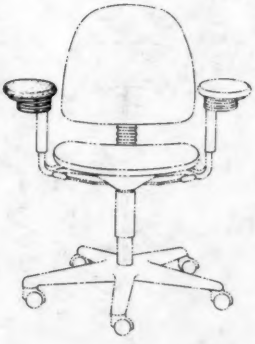


329,768
TABLE BASE
Alfred J. Intardonato, 271 Skip La., Bay Shore, N.Y. 11706
Filed Mar. 21, 1991, Ser. No. 673,106
Term of patent 14 years
U.S. Cl. D6—495

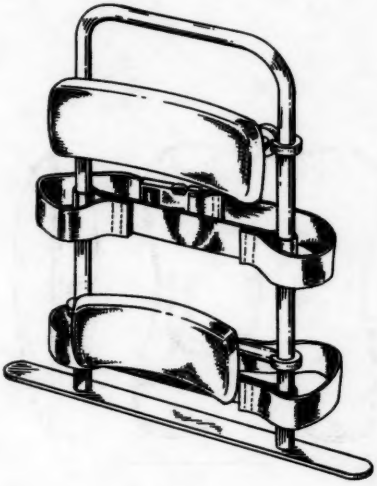
329,769
FURNITURE BASE
Leo Martin, Coconut Grove, Fla., assignor to Miami Metal Products, Inc., Miami, Fla.
Filed May 3, 1990, Ser. No. 518,204
Term of patent 14 years
U.S. Cl. D6—497



329,770
ARMREST FOR A CHAIR
Fredrich W. Grahl, Coldwater, Mich., and Jack Litewka, Seattle, Wash., assignors to Grahl Industries, Inc., Coldwater, Mich.
Filed Feb. 2, 1989, Ser. No. 305,496
Term of patent 14 years
U.S. Cl. D6—501

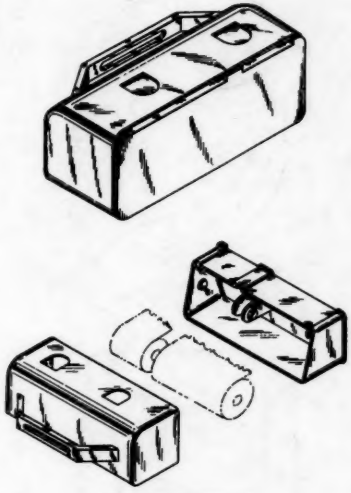


329,771
ADJUSTABLE BACKREST
Dennis Zacharkow, 1532 - 10th St. SE., Apt. 6-C, Rochester, Minn. 55904
Filed Aug. 24, 1989, Ser. No. 398,097
Term of patent 14 years
U.S. Cl. D6—502

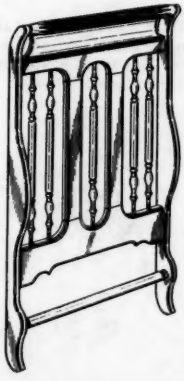


329,772
OPENWORK DESIGN FOR SEAT BACKS
Manfred Hubert, Meylan, France, assignor to Allibert S.A., Grenoble, France
Filed May 18, 1990, Ser. No. 524,823
Claims priority, application World Int. Prop. O., Nov. 20, 1989, DM/015120
Term of patent 14 years
U.S. Cl. D6—502

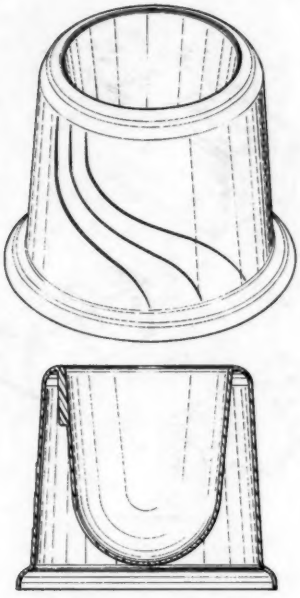
329,773
DISPENSER FOR ROLLED MATERIAL
F. Clark Addison, 3804 W. Eisenhower Ave., Loveland, Colo. 80537, and Peder J. Thorstensen, P.O. Box 1025, Loveland, Colo. 80539
Filed Apr. 26, 1990, Ser. No. 514,572
Term of patent 14 years
U.S. Cl. D6—520



329,774
CRIB ENDBOARD
Merlin A. Brunner, Appleton, and Harvey J. Draheim, Weyauwega, both of Wis., assignors to Simmons Juvenile Products Company, Inc., New London, Wis.
Filed Mar. 27, 1990, Ser. No. 500,264
Term of patent 14 years
U.S. Cl. D6—508

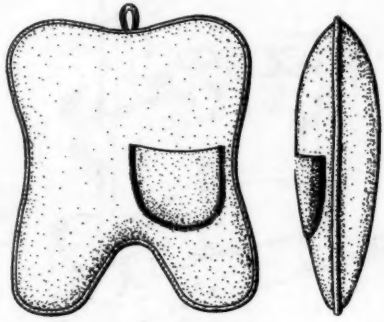


329,775
TOILET BOWL BRUSH HOLDER
Kent W. Murphy, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 25, 1990, Ser. No. 528,778
Term of patent 14 years
U.S. Cl. D6—551

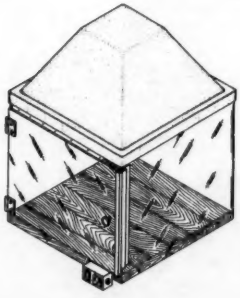


329,776
KITCHEN ARTICLES HOLDER
Mark Ma, 1415 Martens Dr., Hammond, La. 70401
Filed Jul. 27, 1990, Ser. No. 558,396
Term of patent 14 years
U.S. Cl. D6—570

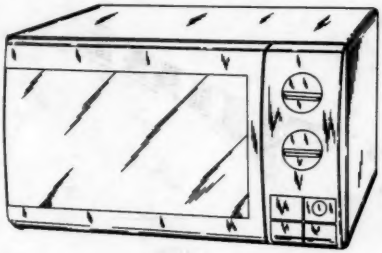
329,777
PILLOW
Bernadette M. Picco, 821 Countrywood Pl., Fort Wayne, Ind. 46845
Filed Oct. 3, 1990, Ser. No. 592,062
Term of patent 14 years
U.S. Cl. D6—601

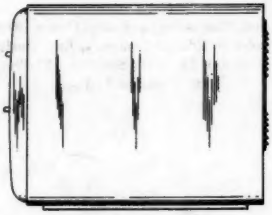


329,778
PIZZA WARMER
Jimmy W. Easterling, and Michael Cooper, both of Clanton, Ala., assignors to Wayne Industries, Inc., Clanton, Ala.
Filed Sep. 18, 1989, Ser. No. 408,791
Term of patent 14 years
U.S. Cl. D7—323

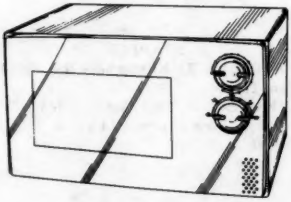


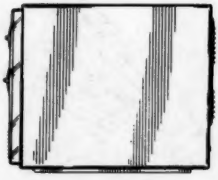
329,779
MICROWAVE OVEN
Philippe Piret, Cormelles-Le-Royal, France, assignor to Moulinex Societe Anonyme, Bagnolet, France
Filed Sep. 11, 1990, Ser. No. 580,872
Claims priority, application France, May 2, 1990, 90 2841
Term of patent 14 years
U.S. Cl. D7—351



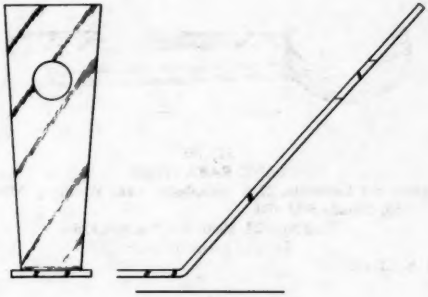


329,780
MICROWAVE OVEN
Philippe Piret, 1876, route de Bretteville, F-14123 IFS, France
Filed Apr. 24, 1991, Ser. No. 690,803
Claims priority, application France, Oct. 26, 1990, 90 6718
Term of patent 14 years
U.S. Cl. D7—351



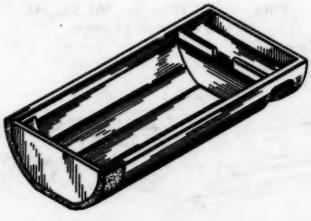


329,781
HOLDER FOR WINE BOTTLE AND THE LIKE
Kuniro Ito, No. 4-6, Nihonbashi Ningyo-cho 1-chome, Chuo-ku, Tokyo, Japan
Filed Oct. 22, 1990, Ser. No. 602,974
Term of patent 14 years
U.S. Cl. D7—619



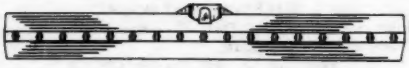
329,782
COVERED CONTAINER
JoEllen N. Narsutis, Oak Park, Ill., assignor to Kraft General Foods, Inc., Northfield, Ill.
Filed Dec. 14, 1990, Ser. No. 628,730
Term of patent 14 years
U.S. Cl. D7—629

329,783
HOLDER FOR A GRATER OR THE LIKE
Bruce Ancona, and Jane Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jan. 23, 1990, Ser. No. 465,001
Term of patent 14 years
U.S. Cl. D7—641



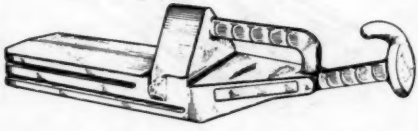
329,784
ICE CREAM SCOOP
Joseph F. Wong, Kowloon, Hong Kong, assignor to Motor Electric Mfg. C., Ltd., Hong Kong
Filed Jan. 17, 1990, Ser. No. 466,688
Term of patent 14 years
U.S. Cl. D7—681

329,785
SAND RAKE HEAD
Alexander Colonello, 2756 Assiniboine Ave., Winnipeg, Manitoba, Canada R3J 0B1
Filed Apr. 23, 1990, Ser. No. 516,825
Term of patent 14 years
U.S. Cl. D8—13

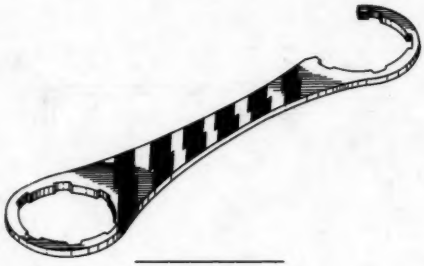


329,786
BROKEN BOLT EXTRACTOR
Eli Polonsky, Aurora, Colo., assignor to Alden Corporation, Wolcott, Conn.
Filed Oct. 11, 1989, Ser. No. 419,835
Term of patent 14 years
U.S. Cl. D8—14

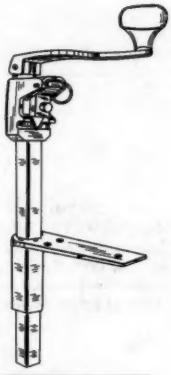
329,787
TAMPING TOOL FOR A CHIPPER/SHREDDER
Kevin J. Connolly, Ballston Lake; James M. D'Aleo, Clifton Park, both of N.Y., and Clifford J. Griffith, Clemmons, N.C., assignors to Garden Way Incorporated, Troy, N.Y.
Filed Jul. 17, 1990, Ser. No. 555,141
Term of patent 14 years
U.S. Cl. D8—14



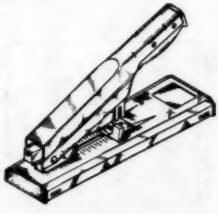
329,788
COMBINATION WRENCH FOR LOCK NUTS
Peter Andrew, 3013 39th St., Tampa, Fla. 33605
Filed May 23, 1990, Ser. No. 527,250
Term of patent 14 years
U.S. Cl. D8—17



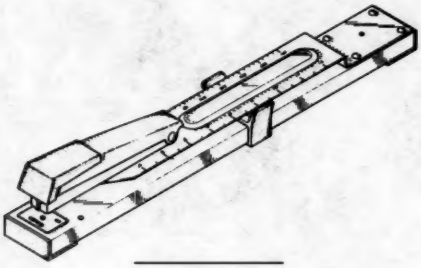
329,789
CAN OPENER
Laurence Bartlett, Colchester, and John Cowan, Richmond, both of Vt., assignors to Edlund Company, Inc., Burlington, Vt.
Filed Jul. 23, 1990, Ser. No. 557,484
Term of patent 14 years
U.S. Cl. D8—33



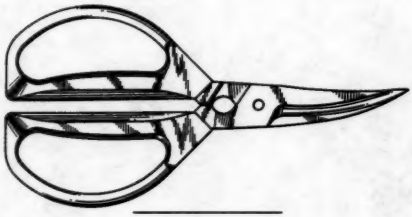
329,790
STAPLER
William H. N. Chi, No. 32, Kwangcheng Rd., Tali Hsiang, Taichung hsien, Taiwan
Filed Sep. 26, 1991, Ser. No. 765,715
Term of patent 14 years
U.S. Cl. D8—50



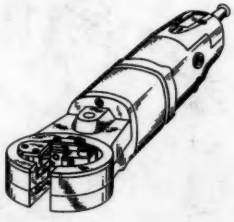
329,791
STAPLER
William H. N. Chi, No. 32, Kwangcheng Rd., Tali Hsiang, Taichung Hsien, Taiwan
Filed Sep. 26, 1991, Ser. No. 765,718
Term of patent 14 years
U.S. Cl. D8—50



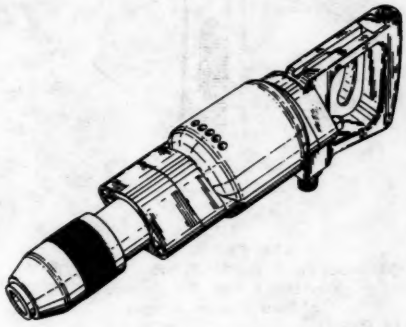
329,792
CULINARY SCISSORS
Helen Chen, 114 East St., Lexington, Mass. 02173
Filed Aug. 1, 1990, Ser. No. 562,159
Term of patent 14 years
U.S. Cl. D8—57



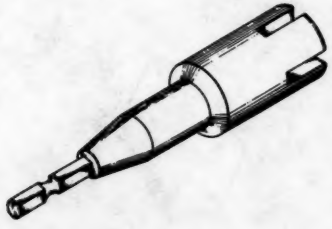
329,793
PIPE CUTTER
Kenji Fukuda, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan
Filed Jul. 3, 1990, Ser. No. 547,157
Claims priority, application Japan, Jan. 16, 1990, 2-470
Term of patent 14 years
U.S. Cl. D8—60



329,794
DRILL
Michael Graham, Cramlington, England, assignor to Thor Tools Limited, United Kingdom
Filed Apr. 10, 1990, Ser. No. 514,046
Claims priority, application United Kingdom, Oct. 10, 1989, 2001598
Term of patent 14 years
U.S. Cl. D8—68



329,795
WIRE CONNECTOR DRIVER
Samuel K. Bird, 10421 Markein Ave., Mission Hills, Calif. 91345, and Jimmy J. Bennett, 6036 Stafford Ave., Huntington Park, Calif. 90255
Filed Aug. 14, 1990, Ser. No. 567,350
Term of patent 14 years
U.S. Cl. D8—70

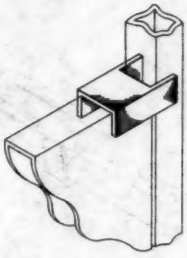


329,796
HAMMER HANDLE GRIP
John D. Olson, Kensington, Conn., and Kenneth W. Hreha, Tullahoma, Tenn., assignors to The Stanley Works, New Britain, Conn.
Filed Jul. 21, 1988, Ser. No. 222,235
Term of patent 14 years
U.S. Cl. D8—80

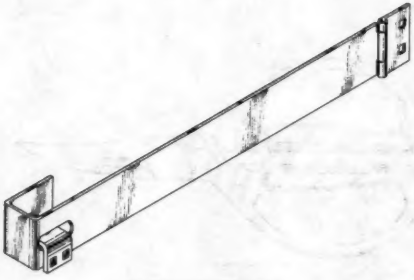
329,797
KNIFE SHARPENER
John M. Baker, Rte. 3, Box 365-E, Sylva, N.C. 28779
Filed Dec. 4, 1989, Ser. No. 445,020
Term of patent 14 years
U.S. Cl. D8—93

329,798
LETTER OPENER
Jeffrey A. Kramer, 1241 NE. 83rd St., Miami, Fla. 33138, and William W. Rosenfeld, 8810 NW. 15th St., Pembroke Pines, Fla. 33024
Filed Jan. 14, 1991, Ser. No. 641,114
Term of patent 14 years
U.S. Cl. D8—102

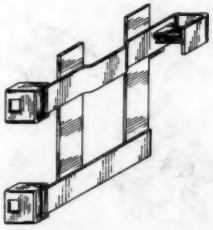
329,799
PORTABLE SWINGING DOOR LOCK
Eva C. Conklin, 4666 Garrett Dr., Norton, Ohio 44203
Filed Sep. 26, 1990, Ser. No. 588,958
Term of patent 14 years
U.S. Cl. D8—331



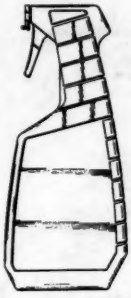
329,800
COMBINATION SECURITY BAR AND PADLOCK COVER
Stanley W. Pearson, Rte. 1 Box 654-A, Beaufort, N.C. 28516
Filed Jan. 28, 1991, Ser. No. 646,334
Term of patent 14 years
U.S. Cl. D8—346



329,801
ANTI-THEFT ASSEMBLY FOR A VIDEO GAME CABINET ACCESS DOOR
Stanley W. Pearson, Rt. 1 70 box 654-A Hwy. 101, Beaufort, N.C. 28516
Filed Jul. 29, 1991, Ser. No. 736,819
Term of patent 14 years
U.S. Cl. D8—346



329,802
SPRAYER BOTTLE OR SIMILAR ARTICLE
Donald D. Foster, St. Charles, Mo., and Douglas F. Wolff, Marshall, Mich., assignors to Contico International, Inc., St. Louis, Mo.
Filed May 30, 1990, Ser. No. 530,975
Term of patent 14 years
U.S. Cl. D9—300

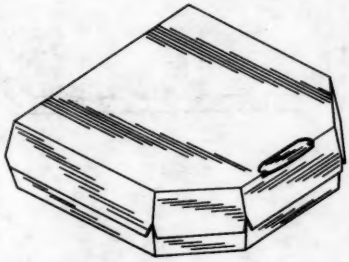


329,803
BOTTLE
Akihiko Otsuka, Nishinomiya, Japan, assignor to Otsuka Foods Co., Ltd., Osaka, Japan
Filed Oct. 16, 1989, Ser. No. 421,686
Claims priority, application Japan, Apr. 21, 1989, 14913
Term of patent 14 years
U.S. Cl. D9—332

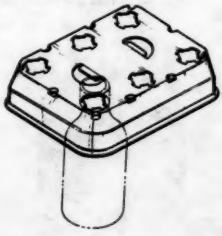
329,804
COMBINED PACKAGE WITH PAPER ROLLS
Donald D. Dearwester, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Oct. 31, 1990, Ser. No. 606,645
Term of patent 14 years
U.S. Cl. D9—341

329,805
COMBINED BOTTLE AND CAP
M. Laurent Normand, Paris, France, assignor to Parfum Rochas
Filed Dec. 11, 1990, Ser. No. 625,987
Term of patent 14 years
U.S. Cl. D9—520

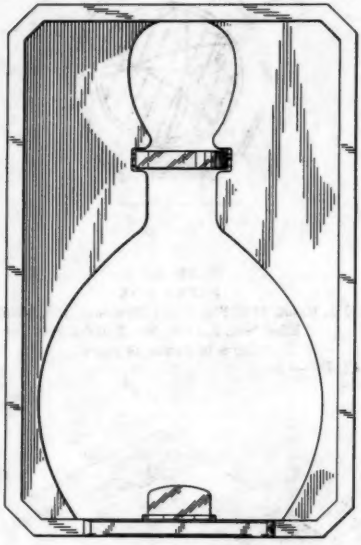
329,806
PAPER BOX
Donald T. Kindt, 1100 Pidco Dr., Plymouth, Ind. 46563
Filed Nov. 5, 1990, Ser. No. 608,890
Term of patent 14 years
U.S. Cl. D9—430



329,807
CONTAINER CARRIER
James E. Heider, 811 W. Wooster, Bowling Green, Ohio 43402
Filed Mar. 16, 1990, Ser. No. 473,697
Term of patent 14 years
U.S. Cl. D9—344

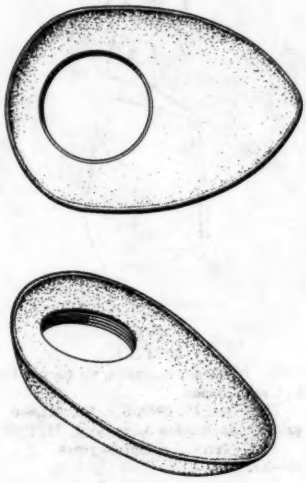


329,808
BOTTLE PACKAGE
Jean-Pierre Giraud, Cognac, France, assignor to E. Remy Martin & Cie, S.A., Cognac, France
Filed May 18, 1990, Ser. No. 524,834
Claims priority, application Hague, Nov. 21, 1989, DM/015 126
Term of patent 14 years
U.S. Cl. D9—415

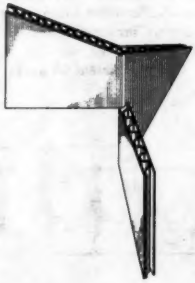


329,809
TAMPERPROOF CAP
John I. Bloomfield, Massey, New Zealand, assignor to Plastic Consulting and Design Limited, Auckland, New Zealand
Filed Oct. 3, 1990, Ser. No. 592,065
Claims priority, application New Zealand, Apr. 6, 1990, 23193
Term of patent 14 years
U.S. Cl. D9—443

329,810
POURING SPOUT FOR A DISPOSABLE LIQUID CONTAINER
Akhil Rastogi, 9416 Mirror Pond Dr., Fairfax, Va. 22032
Filed Jan. 17, 1991, Ser. No. 643,656
Term of patent 14 years
U.S. Cl. D9—447

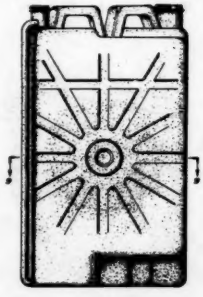


329,811
LOOSE PACKING MATERIAL
Russell W. Tether, 6258 Woodcrest, Dallas, Tex. 75214
Filed Feb. 11, 1991, Ser. No. 653,104
Term of patent 14 years
U.S. Cl. D9—456



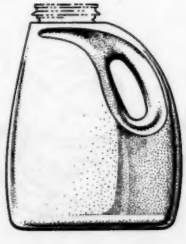
329,812
BOTTLE
Eugene J. Clarke, Winnetka; Joseph H. Riemer, Chicago; Stuart H. Feen, Libertyville, all of Ill., and Charles R. Smith, Independence, Mo., assignors to Stewart Warner Alemite Corporation, Charlotte, N.C.
Filed Mar. 27, 1991, Ser. No. 676,721
Term of patent 14 years
U.S. Cl. D9—523

329,813
CONTAINER
Simon J. Richter, Marietta, Ga., and Frank G. Hohmann, Tenafly, N.J., assignors to The Coca-Cola Company, Atlanta, Ga.
Continuation-in-part of Ser. No. 429,339, Oct. 31, 1989, abandoned. This application Feb. 5, 1992, Ser. No. 831,761
Term of patent 14 years
U.S. Cl. D9—524

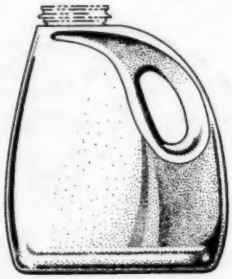


329,814
SQUEEZE BOTTLE
Sidney M. Libit, 441 Lakeside Ter., Glencoe, Ill. 60022
Filed Oct. 4, 1990, Ser. No. 594,991
Term of patent 14 years
U.S. Cl. D9—526

329,815
BOTTLE
Theodore L. Beaver, Roselle, Ill.; Diane J. Pinson, San Ramon, and Craig A. Wissman, Pleaston, both of Calif., assignors to The Clorox Company, Oakland, Calif.
Continuation-in-part of Ser. No. 110,384, Oct. 19, 1987, Pat. No. Des. 313,349. This application Aug. 30, 1989, Ser. No. 400,892
The portion of the term of this patent subsequent to Sep. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—528

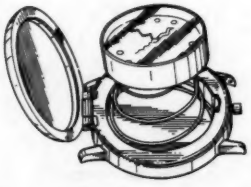


329,816
BOTTLE
Theodore L. Beaver, Roselle, Ill.; Diane J. Pinson, San Ramon, and Craig A. Wissman, Pleasonton, both of Calif., assignors to The Clorox Company, Oakland, Calif.
Continuation-in-part of Ser. No. 110,385, Oct. 19, 1987, Pat. No. Des. 313,350. This application Aug. 30, 1989, Ser. No. 400,894
The portion of the term of this patent subsequent to Sep. 29, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—528

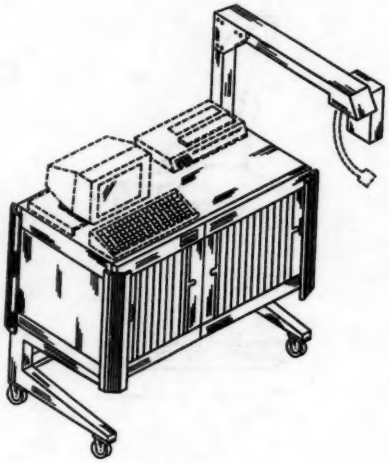


329,817
BOTTLE
Philip C. Best, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Oct. 30, 1990, Ser. No. 605,876
Term of patent 14 years
U.S. Cl. D9—556

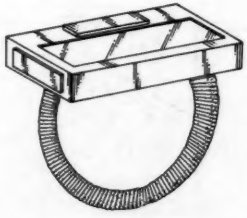
329,818
WRISTWATCH WITH COVER
Leslie Lam, 502 Join-in Hang Sing Centre, 71-75 Container Port Road, Kwai Chung N.T., Hong Kong
Filed Jul. 25, 1990, Ser. No. 557,662
Term of patent 14 years
U.S. Cl. D10—39



329,819
AUTOMOTIVE DIAGNOSTIC SYSTEM
Thomas D. Bottcher, Boynton Beach, and William E. Bratton, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 29, 1990, Ser. No. 471,989
Term of patent 14 years
U.S. Cl. D10—75



329,820
COMBINATION RING TIMER AND LAP COUNTER
Sally Lawlor, 23 Henry St., Bergenfield, N.J. 07621
Filed Nov. 20, 1991, Ser. No. 795,088
Term of patent 14 years
U.S. Cl. D10—97



329,821

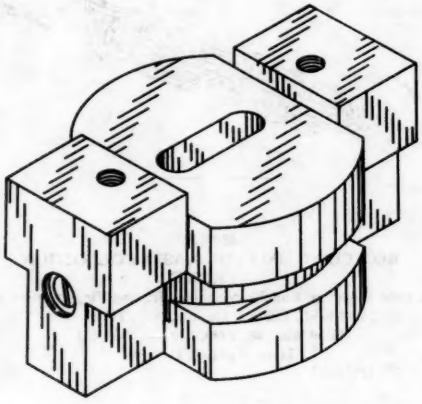
APPARATUS FOR THE MEASUREMENT OF FINE PARTICLES IN LIQUID SUSPENSION BY THE LIGHT SCATTERING PROCEDURE

Philip J. Wyatt, Santa Barbara, and Richard F. Shuck, Goleta, both of Calif., assignors to Wyatt Technology Corporation, Santa Barbara, Calif.

Filed Feb. 21, 1989, Ser. No. 380,551

Term of patent 14 years

U.S. Cl. D10—103



329,822

ILLUMINABLE WALKING CANE

Juan Francisco, New York, N.Y., assignor to See See, Inc., New York, N.Y.

Filed Jan. 11, 1991, Ser. No. 641,104

Term of patent 14 years

U.S. Cl. D10—104

329,823

COMBINED PEN AND SIGNALLING LIGHT

Juan Francisco, New York, N.Y., assignor to See See, Inc., New York, N.Y.

Filed Jan. 11, 1991, Ser. No. 641,106

Term of patent 14 years

U.S. Cl. D10—104

329,824

COMBINED SIGNALLING LIGHT AND POCKET CLIP THEREFOR

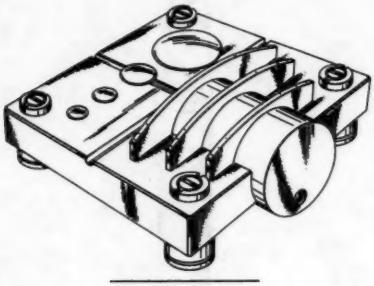
Juan Francisco, New York, N.Y., assignor to See See, Inc., New York, N.Y.

Filed Jan. 11, 1991, Ser. No. 641,108

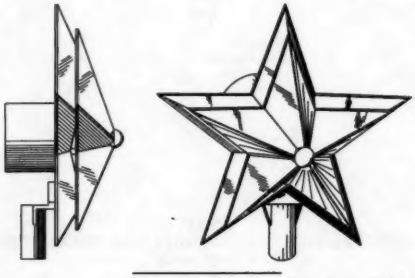
Term of patent 14 years

U.S. Cl. D10—104

329,825
LONG JUMP FOOT FAULT DETECTOR
Michael C. Taylor, 229 N. Lancaster, Bolingbrook, Ill. 60439, and Martin Thaler, Chicago, Ill., assignors to Michael C. Taylor, Bolingbrook, Ill.
Filed Aug. 13, 1990, Ser. No. 566,491
Term of patent 14 years
U.S. Cl. D10—106

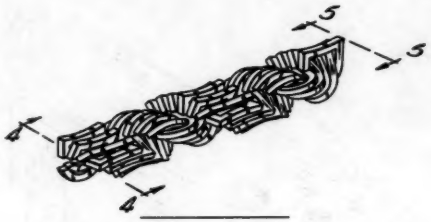


329,826
LIGHTED TREE ORNAMENT
Thomas G. Taylor, Box 486, Liberty, Mo. 64068
Filed Dec. 20, 1990, Ser. No. 630,945
Term of patent 14 years
U.S. Cl. D11—124

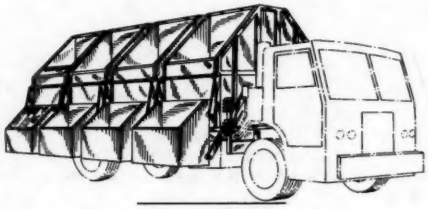


329,827
DESKTOP NOVELTY FIGURINE
Fred Hollinger, King Park, N.Y., assignor to E & B Giftware, Inc., Mount Vernon, N.Y.
Filed Apr. 3, 1989, Ser. No. 332,764
Term of patent 14 years
U.S. Cl. D11—160

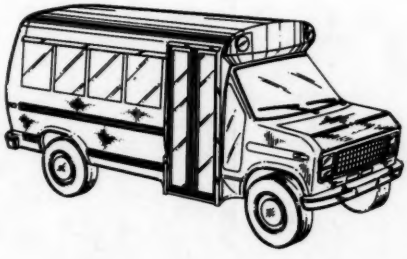
329,828
JEWELRY CHAIN
Krikor Bedoyan, North Hollywood, Calif., assignor to Oroamerica, Inc., Burbank, Calif.
Filed Aug. 31, 1990, Ser. No. 576,706
Term of patent 14 years
U.S. Cl. D11—13



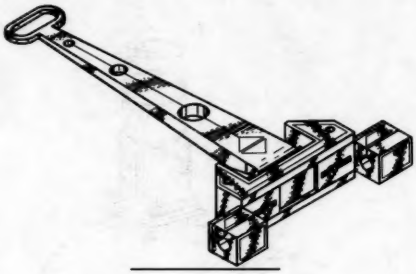
329,829
RECYCLING UNIT FOR WASTE COLLECTION VEHICLE
Rudolfo Mangino; Rudolfo Mangino, Jr., and Virgil Collins, all of 53-24 98th St., Corona, Queens, N.Y. 11368
Filed Aug. 20, 1990, Ser. No. 569,462
Term of patent 14 years
U.S. Cl. D12—15



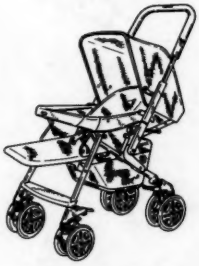
329,830
BUS
Jean-Marc Girardin, 33 High Ridge Ct., Cambridge, Ont., Canada N1R 7L3
Filed Jun. 5, 1989, Ser. No. 361,102
Term of patent 14 years
U.S. Cl. D12—84



329,831
PULLING HANDLE UNIT FOR ATTACHMENT TO THE HANDLEBARS OF A TRICYCLE OR THE LIKE
William F. Chambless, P.O. Box 993, Jerome, Ariz. 86331
Filed Sep. 10, 1990, Ser. No. 579,495
Term of patent 14 years
U.S. Cl. D12—114

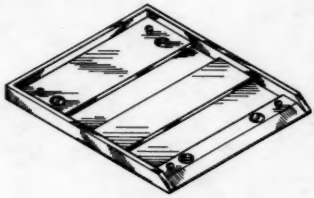


329,832
BABY STROLLER
Takashi Ishikura, and Tatsuo Nakamata, both of Tokyo, Japan, assignors to Combi Corporation, Tokyo, Japan
Filed Feb. 14, 1991, Ser. No. 655,910
Claims priority, application Japan, Oct. 8, 1990, 2-33630
Term of patent 14 years
U.S. Cl. D12—129

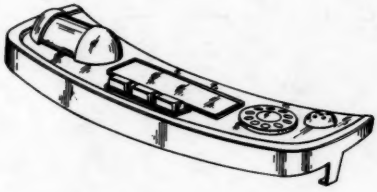


329,833
WALKER
Karl A. Andersson, and Morgan Ferm, both of Malmo, Sweden, assignors to Etac AB, Anderstorp, Sweden
Filed Oct. 5, 1990, Ser. No. 593,938
Claims priority, application Sweden, Apr. 6, 1990, 90-0803
Term of patent 14 years
U.S. Cl. D12—130

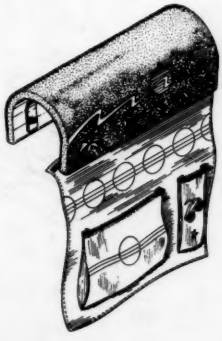
329,834
WHEELCHAIR RESTRAINT
Ronald K. Miller, 157 Rangeview Dr., Bailey, Colo. 80421
Filed Feb. 4, 1991, Ser. No. 649,929
Term of patent 14 years
U.S. Cl. D12—133



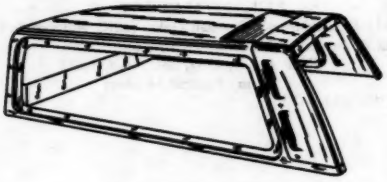
329,835
BABY'S WALKER TRAY
Jeffrey I. Scheinrock, Sherman Oaks, Calif., assignor to Phoenix Prams, Inc., Woodland Hills, Calif.
Filed Apr. 1, 1991, Ser. No. 678,632
Term of patent 14 years
U.S. Cl. D12—133



329,836
COMBINED VEHICLE WINDOW ARM REST AND DETACHABLE ARTICLE HOLDER
Marvin Meyers, 10817 SW. 90th Ct. (Oak Run), Ocala, Fla. 32676
Filed Jan. 5, 1990, Ser. No. 461,447
Term of patent 14 years
U.S. Cl. D12—155

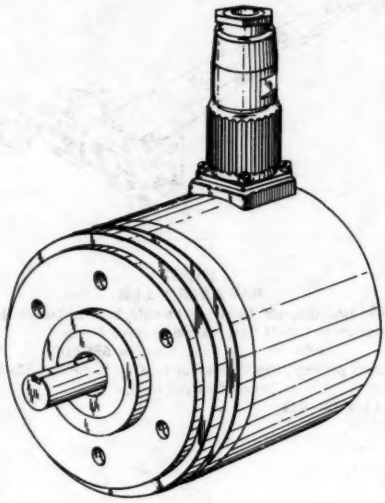


329,837
CAP FOR THE BED OF A PICKUP TRUCK
Charles R. Rogers, 1500 North St., Apt. D39, Jackson, Mich. 49202
Filed Jan. 28, 1991, Ser. No. 646,337
Term of patent 14 years
U.S. Cl. D12—156

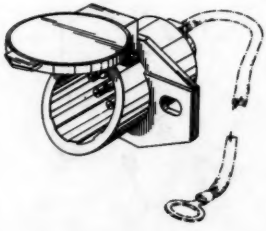


329,838
MULTI-PURPOSE STORAGE RACK FOR MOUNTING ABOVE THE ENGINE ON A BOAT
Michael R. Dean, 1843 Surf and Sand, Bullhead City, Ariz. 86442
Filed Jul. 27, 1990, Ser. No. 559,561
Term of patent 14 years
U.S. Cl. D12—318

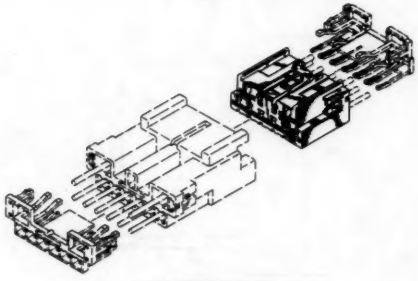
329,839
INCREMENTAL CODER
Michel Ehrhart, Strasbourg, France, assignor to Hohner Automation Societe Anonyme, Eckbolsheim, France
Filed Jul. 6, 1990, Ser. No. 548,843
Claims priority, application France, Jan. 31, 1990, 632
Term of patent 14 years
U.S. Cl. D13—118



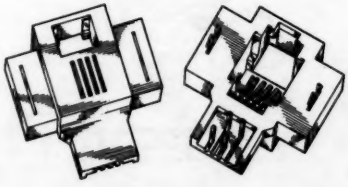
329,840
ELECTRICAL RECEPTACLE
Emil R. Nociar, Calgary, Canada, assignor to Seismic Products Canada Inc., Calgary, Canada
Filed Nov. 20, 1990, Ser. No. 616,009
Claims priority, application Canada, Jun. 27, 1990, 27-06-90-7
Term of patent 14 years
U.S. Cl. D13—146



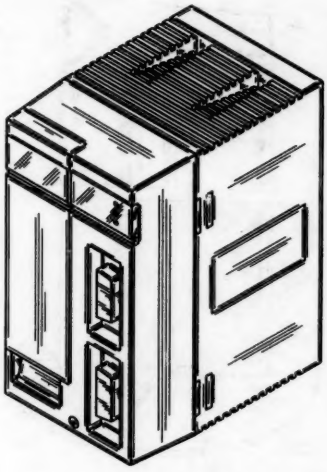
329,841
ELECTRICAL CONNECTOR HOUSING
Makoto Yamanashi, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan
Filed Jul. 2, 1990, Ser. No. 547,346
Claims priority, application Japan, Jan. 16, 1990, 2-000469
Term of patent 14 years
U.S. Cl. D13—147



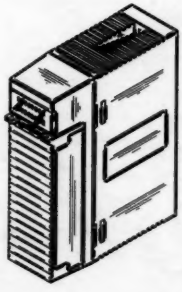
329,842
ELECTRICAL CONNECTOR FOR A PRINTED CIRCUIT BOARD
Toru Watanabe, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan
Filed May 18, 1990, Ser. No. 525,394
Claims priority, application Japan, Dec. 8, 1989, 1-44449
Term of patent 14 years
U.S. Cl. D13—147



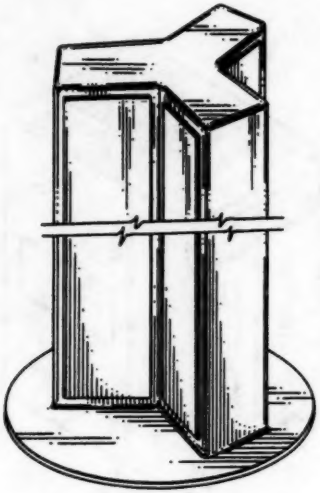
329,843
CONTROL UNIT OF SEQUENCE CONTROLLER
Katsuhiro Ishida, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 8, 1990, Ser. No. 490,973
Claims priority, application Japan, Sep. 13, 1989, 1-33565
Term of patent 14 years
U.S. Cl. D13—162



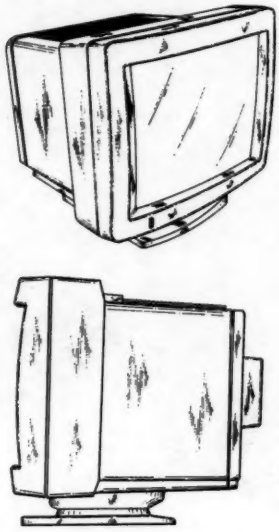
329,844
INPUT/OUTPUT UNIT OF SEQUENCE CONTROLLER
Katsuhiro Ishida, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 8, 1990, Ser. No. 490,974
Claims priority, application Japan, Sep. 13, 1989, 1-33566
Term of patent 14 years
U.S. Cl. D13—162



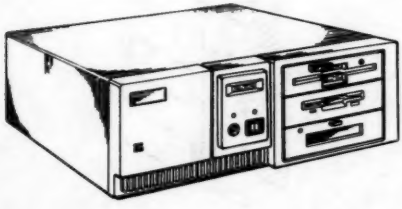
329,845
COVER FOR A MAGNETIC SEPARATOR
Robert Wysolmerski, P.O. Box 26, Hollis, N.H. 03049
Filed Dec. 20, 1989, Ser. No. 453,466
Term of patent 14 years
U.S. Cl. D13—183



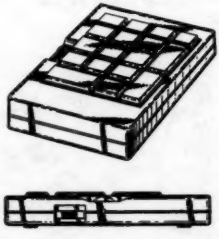
329,847
VIDEO DISPLAY TERMINAL
Margaret L. Hetfield, Belmont, and Marcus Koepke, Concord, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Apr. 2, 1990, Ser. No. 503,167
Term of patent 14 years
U.S. Cl. D14—113



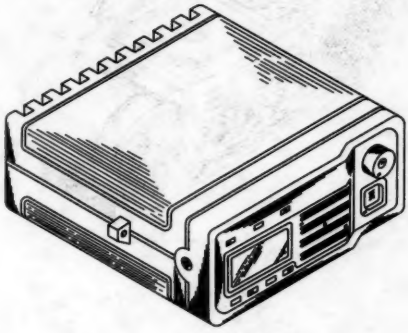
329,846
COMPUTER
Richard V. Haner, Spring, Tex., assignor to Dell USA, L.P.
Filed Feb. 8, 1990, Ser. No. 477,103
Term of patent 14 years
U.S. Cl. D14—100



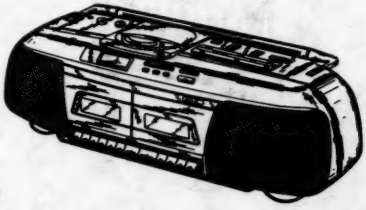
329,848
NUMERICAL KEYBOARD FOR NOTEBOOK COMPUTER
Kanji Mizusugi; Kensho Tsuji, and Fumikazu Shimanuki, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Sep. 18, 1990, Ser. No. 584,182
Claims priority, application Japan, Mar. 20, 1990, 2-9336
Term of patent 14 years
U.S. Cl. D14—115



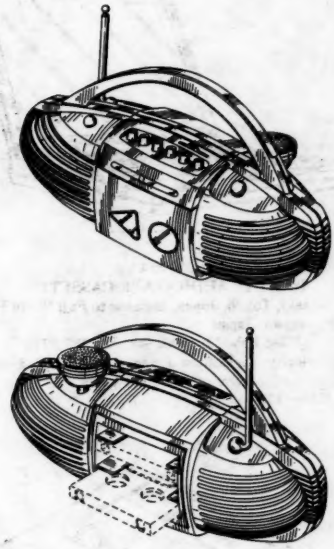
329,849
MOBILE RADIO
Mas Tokiyama, Arlington, Tex., and Manabu Sasaki, Kawasaki, Japan, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 30, 1990, Ser. No. 516,875
Term of patent 14 years
U.S. Cl. D14—137



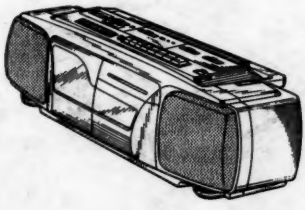
329,850
PORTABLE CASSETTE TAPE RECORDER
Tae Soo Kang, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Feb. 2, 1990, Ser. No. 473,700
Term of patent 14 years
U.S. Cl. D14—164



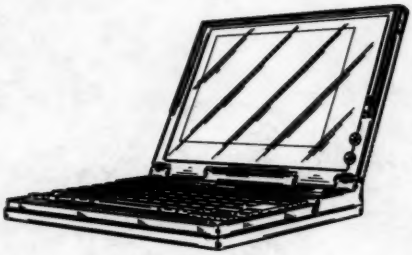
329,851
PORTABLE CASSETTE TAPE RECORDER
Seon I. Yoo, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea
Filed Apr. 6, 1990, Ser. No. 505,545
Claims priority, application Rep. of Korea, Oct. 11, 1989, 13665/1989[U]
Term of patent 14 years
U.S. Cl. D14—165



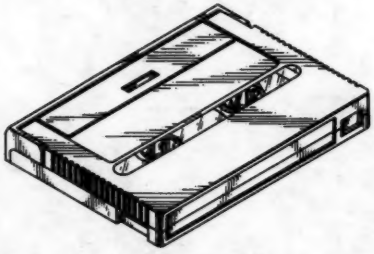
329,852
CASSETTE TAPE RECORDER
Jong B. Lee, Inchon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Jun. 25, 1990, Ser. No. 543,176
Claims priority, application Rep. of Korea, Dec. 29, 1989, 17856/1989[U]
Term of patent 14 years
U.S. Cl. D14—165



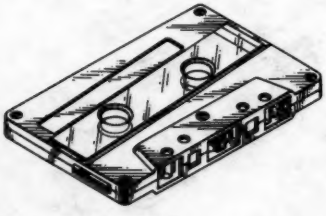
329,853
COMPUTER
Kanji Mizusugi, and Kensho Tsuji, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jun. 18, 1990, Ser. No. 539,665
Claims priority, application Japan, Dec. 22, 1989, 1-47011
Term of patent 14 years
U.S. Cl. D14—106



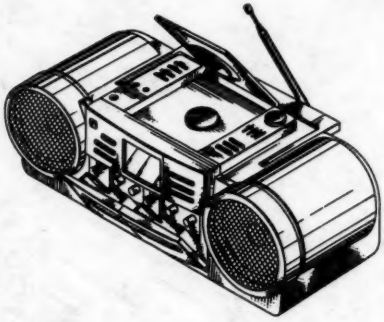
329,854
DIGITAL AUDIO TAPE CASSETTE
Makoto Isozaki, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 23, 1990, Ser. No. 483,787
Claims priority, application Japan, Sep. 8, 1989, 1-33021
Term of patent 14 years
U.S. Cl. D14—121



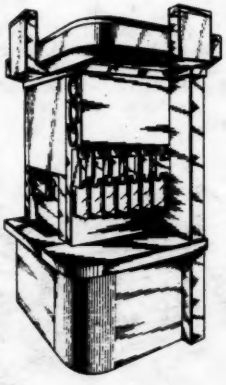
329,855
AUDIO TAPE CASSETTE
Kazuhisa Horikiri, and Makoto Isozaki, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 28, 1990, Ser. No. 493,838
Claims priority, application Japan, Sep. 25, 1989, 1-34856
Term of patent 14 years
U.S. Cl. D14—121



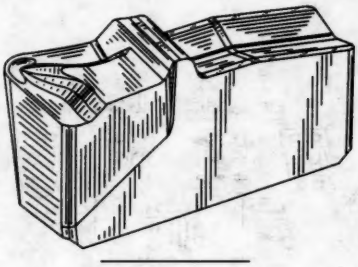
329,856
COMBINED DIGITAL AUDIO DISC PLAYER, RADIO TUNER AND TAPE RECORDER
Hidetoshi Tamaki, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 19, 1990, Ser. No. 601,052
Claims priority, application Japan, Apr. 23, 1990, 2-13907
Term of patent 14 years
U.S. Cl. D14—168



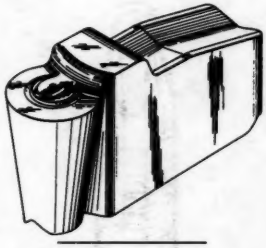
329,857
YOGURT BAR
David W. Laituri, and Vincent L. Haley, both of Worthington, Ohio, assignors to TYS, Inc., Rockville, Md.
Filed Dec. 26, 1989, Ser. No. 456,777
Term of patent 14 years
U.S. Cl. D15—82



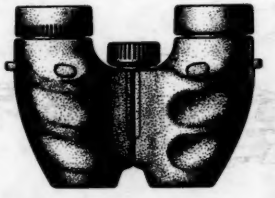
329,858
CUTOFF INSERT
Lars-Erik Gustafsson, Sandviken, Sweden, and Lars T. Pettersson, Glen Rock, N.J., assignors to Sandvik AB, Sandviken, Sweden
Filed Sep. 12, 1989, Ser. No. 406,116
Claims priority, application Sweden, Mar. 14, 1989, 890653
Term of patent 14 years
U.S. Cl. D15—139



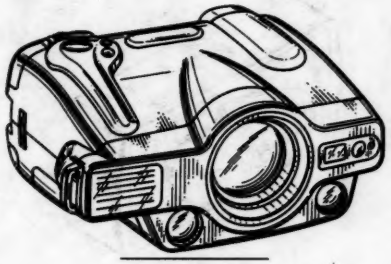
329,859
CUTOFF INSERT
Lars-Erik Gustafsson, Sandviken, Sweden, and Lars T. Pettersson, Glen Rock, N.J., assignors to Sandvik AB, Sandviken, Sweden
Filed Oct. 10, 1989, Ser. No. 418,483
Term of patent 14 years
U.S. Cl. D15—139



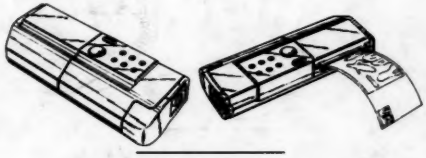
329,860
BINOCULARS
Hitoshi Suyama, Kawasaki, and Yasuki Nagaoka, Ohmiya, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Nov. 9, 1990, Ser. No. 611,367
Claims priority, application Japan, May 15, 1990, 2-16290; May 15, 1990, 2-16291
Term of patent 14 years
U.S. Cl. D16—133



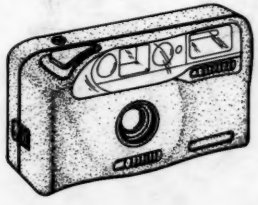
329,861
CAMERA
Makoto Isozaki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 10, 1990, Ser. No. 565,419
Claims priority, application Japan, Mar. 27, 1990, 2-10190
Term of patent 14 years
U.S. Cl. D16—209



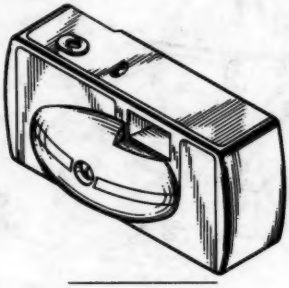
329,862
COMBINED INSTANT CAMERA AND PRINTER
Kenji Watanabe; Takanobu Kameda; Hideto Yokota; Tetsuo Yamaguchi; Tomoyuki Yamaguchi; Yuichiro Taniguchi, and Atsuko Yamaguchi, all of Tokyo, Japan, assignors to King Jim Co., Ltd., Tokyo, Japan
Filed Jun. 20, 1990, Ser. No. 541,295
Claims priority, application Japan, Dec. 20, 1989, 1-46124
Term of patent 14 years
U.S. Cl. D16—208



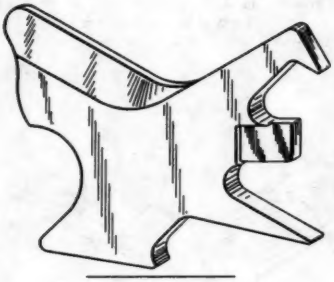
329,863
PHOTOGRAPHIC CAMERA
Steven W. Shull, Sherman Oaks, and Brent M. Kikawa, Monrovia, both of Calif., assignors to Vivitar Corporation, Chatsworth, Calif.
Filed Oct. 2, 1990, Ser. No. 591,866
Term of patent 14 years
U.S. Cl. D16—209



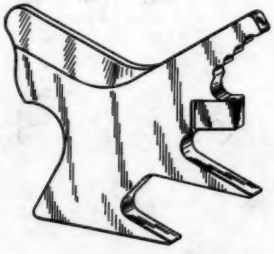
329,864
CAMERA
Hiroaki Kawagoe, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 23, 1990, Ser. No. 617,353
Claims priority, application Japan, Jul. 17, 1990, 2-24207
Term of patent 14 years
U.S. Cl. D16—218



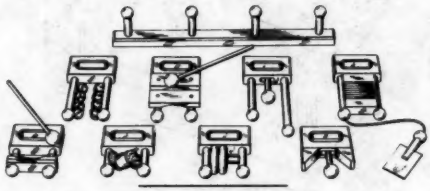
329,865
GUITAR BODY
Joel M. Harriott, P.O. Box 542, Minneapolis, Minn. 55458
Filed Dec. 11, 1989, Ser. No. 448,566
Term of patent 14 years
U.S. Cl. D17—20



329,866
GUITAR BODY
Joel M. Harriott, P.O. Box 542, Minneapolis, Minn. 55458
Filed Dec. 11, 1989, Ser. No. 448,569
Term of patent 14 years
U.S. Cl. D17—20

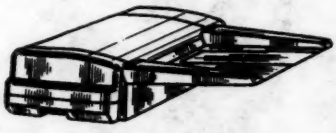


329,867
COMBINED SET OF MUSICAL INSTRUMENTS AND SUPPORT THEREFOR
Erich Hoerz, Muensingen, Fed. Rep. of Germany, assignor to Helmut Leismann OHG, Ingbert, Fed. Rep. of Germany
Filed Jan. 3, 1989, Ser. No. 292,876
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1988, M 88 00 041.9
Term of patent 14 years
U.S. Cl. D17—22

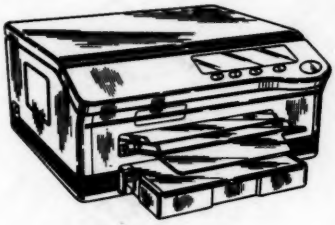


329,868
TONER CASE FOR COPYING MACHINE
Eiji Sakaguchi, Machida, and Yutaka Ban, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 21, 1990, Ser. No. 586,596
Claims priority, application Japan, Apr. 3, 1990, 2-11497
Term of patent 14 years
U.S. Cl. D18—43

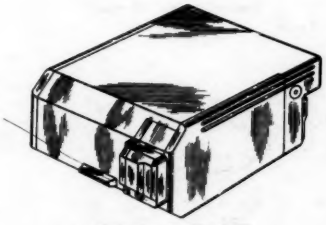
329,869
AUTOMATIC DOCUMENT FEEDER FOR COPYING MACHINE
Noriyuki Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 22, 1990, Ser. No. 526,617
Claims priority, application Japan, Nov. 22, 1989, 1-42889
Term of patent 14 years
U.S. Cl. D18—49



329,870
THERMAL PRINTER
Yoshio Hanasaki, Hiroshima; Masaharu Sawatani, and Toshiya Yoshida, both of Kanagawa, all of Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan
Filed Aug. 23, 1989, Ser. No. 402,587
Term of patent 14 years
U.S. Cl. D18—55



329,871
PRINTING HEAD FOR PRINTER
Toshio Umino, Yokohama, and Nobuyuki Kuwabara, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 14, 1990, Ser. No. 493,377
Claims priority, application Japan, Sep. 14, 1989, 1-33781
Term of patent 14 years
U.S. Cl. D18—56

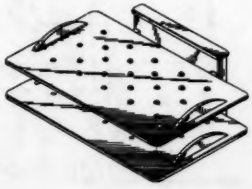


329,872
PAD OF PAPER
Bruce W. Carlson, Minneapolis; Cindy L. Knoblock, St. Paul, and Scott E. Michel, Minneapolis, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 10, 1990, Ser. No. 595,377
Term of patent 14 years
U.S. Cl. D19—26

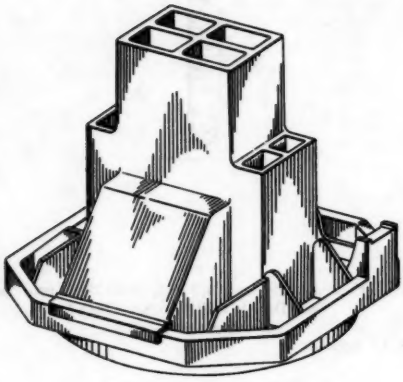
329,873
MARKING INSTRUMENT
Charlie Tu, Taipei, Taiwan, assignor to Chuang Tao Corporation, Taipei, Taiwan
Filed Oct. 18, 1990, Ser. No. 599,905
Term of patent 14 years
U.S. Cl. D19—48

329,874
PEN
Manuel Cuadrado, C/ Sagrera, 53-57, 08027 Barcelona, Spain
Filed Dec. 4, 1990, Ser. No. 622,087
Term of patent 14 years
U.S. Cl. D19—48

329,875
VERTICALLY-MOUNTABLE, PLURAL-LEVEL PAPER TRAY
Timothy R. Stern, and Paul B. Siebert, both of Grand Rapids, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.
Continuation-in-part of Ser. No. 307,588, Feb. 7, 1989, abandoned. This application Sep. 5, 1989, Ser. No. 402,250
Term of patent 14 years
U.S. Cl. D19—92

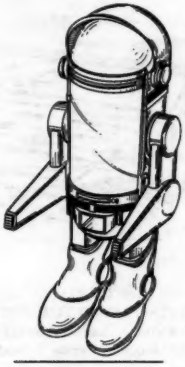


329,876
COMPARTMENTED ORGANIZER FOR OFFICE SUPPLIES
John D. Breen, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 4, 1991, Ser. No. 637,505
Term of patent 14 years
U.S. Cl. D19—75

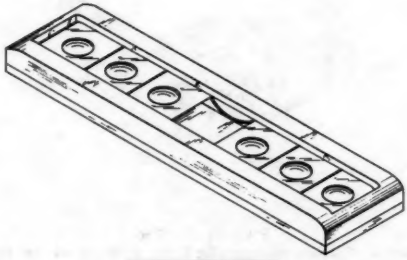


329,877
LOTTERY TICKET DISPENSER
Christopher E. Schafer, R.R. 2, Adair, Iowa 50002
Filed Apr. 16, 1990, Ser. No. 510,784
Term of patent 14 years
U.S. Cl. D20—2

329,878
VENDING MACHINE OR SIMILAR ARTICLE
Chieh-Ju Chen, No. 84-22, Tung-Ping Rd., Tai-Ping Hsiang, Taichung Hsien, Taiwan
Filed Nov. 28, 1990, Ser. No. 619,336
Term of patent 14 years
U.S. Cl. D20—3

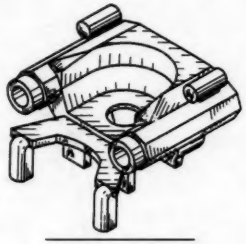


329,879
SLIDING BLOCK GAME
Gwo-Hwa Chern, No. 8-3, Alley 16, Lane 140, Shih Chuan Rd., Sec. 2, Pan chiao, Taipei Hsien, Taiwan
Filed Jan. 13, 1989, Ser. No. 296,715
Term of patent 14 years
U.S. Cl. D21—14

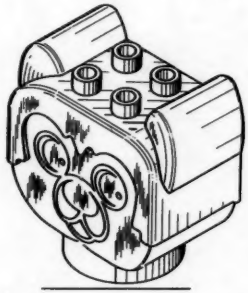


329,880
COIN-OPERATED AMUSEMENT RIDE
Alfonso Cimasa, Nocera Interiore, Italy, assignor to Cimagiochi S.R.L., Nocera Inferiore, Italy
Filed Dec. 10, 1990, Ser. No. 625,591
Term of patent 14 years
U.S. Cl. D21—74

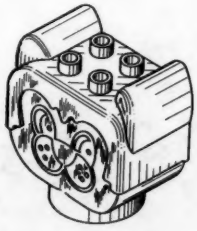
329,881
ELEMENT FOR A TOY BUILDING SET
Stig Alexander M. Spangsberg, Vejle, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,915
Term of patent 14 years
U.S. Cl. D21—108



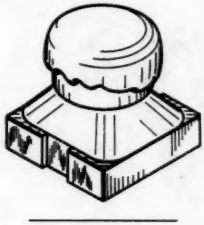
329,882
HEAD FOR A TOY BUILDING SET
Erik H. Rasmussen, Kokkedal, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,942
Term of patent 14 years
U.S. Cl. D21—108



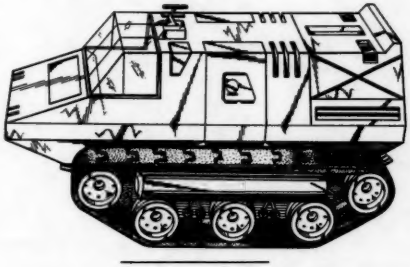
329,883
HEAD FOR A TOY BUILDING SET
Erik H. Rasmussen, Kokkedal, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,943
Term of patent 14 years
U.S. Cl. D21—108



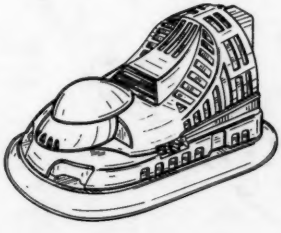
329,884
FIGURE FOR A TOY BUILDING SET
Berit Holmstrøm, Roskilde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1990, Ser. No. 621,951
Term of patent 14 years
U.S. Cl. D21—108



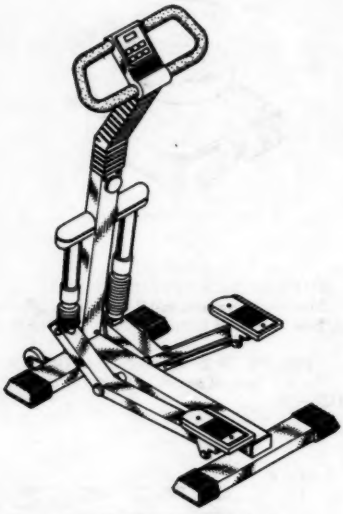
329,885
TOY TRACKED CARRIER VEHICLE
Norman C. Maarschalkerweerd, and Bernadette E. Maarschalkerweerd, both of 3773-B Elmside Village La., Norcross, Ga. 30092
Filed Jul. 15, 1991, Ser. No. 731,716
Term of patent 14 years
U.S. Cl. D21—131



329,886
AIR CUSHION BOAT TOY
Takashi Fujitani, Tokyo, Japan, assignor to Kabushiki Kaisha Gakushu Kenkyusha, Tokyo, Japan
Filed Jul. 9, 1990, Ser. No. 549,711
Claims priority, application Japan, Apr. 17, 1990, 2-13030
Term of patent 14 years
U.S. Cl. D21—130



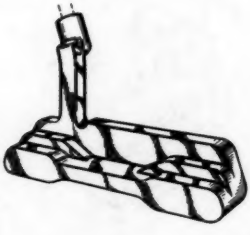
329,887
CLIMBING EXERCISER
Lien C. Yang, 11F. No. 149, Roosevelt Rd. Sec. 3, Taipei, Taiwan
Filed Jul. 5, 1990, Ser. No. 548,420
Term of patent 14 years
U.S. Cl. D21—195



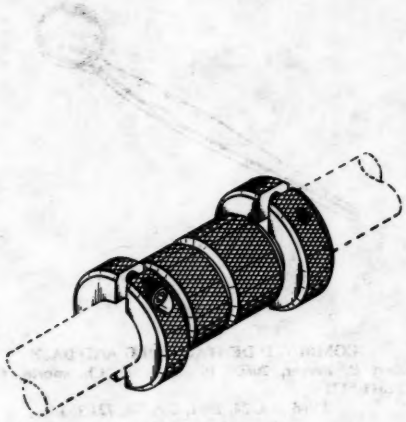
329,888
HOCKEY STICK
William D. Christian, Warroad, Minn., assignor to Christian Brothers, Inc., Warroad, Minn.
Filed Dec. 19, 1989, Ser. No. 452,941
Term of patent 14 years
U.S. Cl. D21—211

329,889
GOLF PUTTER
Eric J. Scott, 9846 Rose Hill Rd. #12, Berrien Springs, Mich. 49103
Filed Nov. 21, 1989, Ser. No. 439,561
Term of patent 14 years
U.S. Cl. D21—217

329,890
GOLF PUTTER
Bernard L. Pinder, Grand Haven, Mich., assignor to Pinnich, Ltd., Grand Haven, Mich.
Continuation-in-part of Ser. No. 511,582, Apr. 20, 1990, abandoned. This application Nov. 21, 1990, Ser. No. 617,070
Term of patent 14 years
U.S. Cl. D21—217



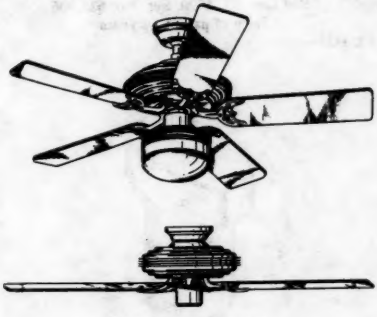
329,891
GARDEN HOSE CLAMP
Stanley Sievers, 2422 1st St., Corona del Mar, Calif. 92660
Filed Feb. 5, 1990, Ser. No. 475,083
Term of patent 14 years
U.S. Cl. D23—262



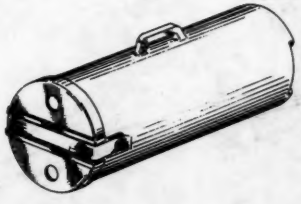
329,892
LIQUID DISPENSER FOR ADDING SKIN TONER TO SHOWER WATER
Richard C. Brister, 3516 W. 43rd, Anchorage, Ak. 99517
Filed Apr. 10, 1990, Ser. No. 506,891
Term of patent 14 years
U.S. Cl. D23—228

329,893
ANTI-SPLASH MAT FOR URINAL OR THE LIKE
Richard C. Luedtke, Whiteladyes, Sandy Way, Cobham, Surrey KT11, and Kandiah Mahanandan, Wooden Cottage, Firs Road, Kenley, Surrey CR2, both of United Kingdom
Filed Mar. 11, 1991, Ser. No. 668,422
Term of patent 14 years
U.S. Cl. D23—310

329,894
COMBINED CEILING FAN AND LIGHT
Robert L. Scofield, Cordova, Tenn., assignor to Hunter Fan Company, Memphis, Tenn.
Filed Feb. 14, 1991, Ser. No. 655,891
Term of patent 14 years
U.S. Cl. D23—377



329,895
DUCT CANISTER FOR CARRYING AND STORING SECTIONS OF A FLEXIBLE DUCT USED WITH PORTABLE VENTILATORS
Mark S. Chumsae, Shrewsbury, Mass., assignor to Coppus Engineering Corporation, Millbury, Mass.
Filed Jun. 18, 1990, Ser. No. 539,676
Term of patent 14 years
U.S. Cl. D23—393

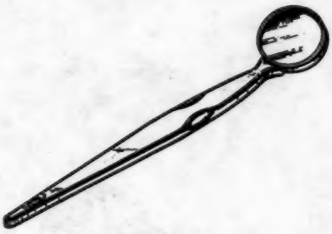


329,896
CEILING FAN BLADE
William N. Taylor, III, P.O. Box 810121, Dallas, Tex. 75381-0121
Continuation-in-part of Ser. No. 490,950, Mar. 9, 1990, Pat. No. Des. 325,778. This application May 21, 1991, Ser. No. 703,354
The portion of the term of this patent subsequent to Mar. 13, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—413

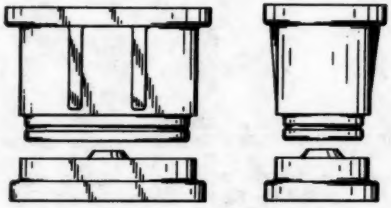
329,897
WINGED EARPLUG
Howard S. Leight, 4061 Glencoe Ave., Marina Del Rey, Calif. 90292
Filed Dec. 11, 1990, Ser. No. 625,606
Term of patent 14 years
U.S. Cl. D24—106

329,898
MYOCARDIAL LEAD INTRODUCER
Robert G. Dutcher, and John C. Hill, both of 8325 10th Ave. North, Minneapolis, Minn. 55427
Filed Nov. 2, 1989, Ser. No. 430,482
Term of patent 14 years
U.S. Cl. D24—133

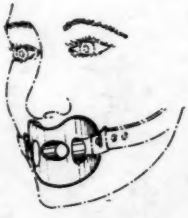
329,899
DENTAL MIRROR
Munir Rihani, 187 Belevedere Dr., Cranston, R.I. 02920
Filed Dec. 26, 1990, Ser. No. 634,337
Term of patent 14 years
U.S. Cl. D24—139



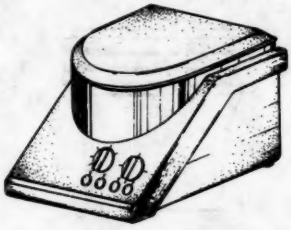
329,900
COMBINED DENTAL MOLD AND BASE
Robert P. Berger, 20600 Plummer St., Chatsworth, Calif. 91311-5121
Filed Jun. 24, 1991, Ser. No. 721,203
Term of patent 14 years
U.S. Cl. D24—181



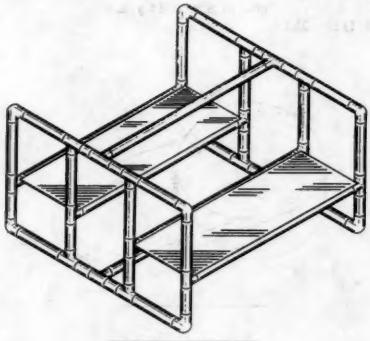
329,901
PEDIATRIC ENDOSCOPIC BITE BLOCK
Frank W. Jackson, Mechanicsburg, Pa., assignor to G. I. Supply, Inc., Camp Hill, Pa.
Filed May 13, 1991, Ser. No. 699,554
Term of patent 14 years
U.S. Cl. D24—176



329,902
MICROCENTRIFUGE
Young R. Kim, 271-19 Samjeong-Dong, Jung-Ku, Buchun, Rep. of Korea
Filed May 11, 1990, Ser. No. 521,932
Term of patent 14 years
U.S. Cl. D24—219

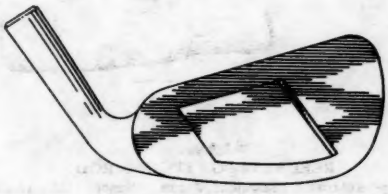


329,903
UNDERWATER PLATFORM
Michael P. Craig, 2302 Sorret Tree Ct., Austin, Tex. 78744-2826
Filed Jun. 21, 1990, Ser. No. 541,347
Term of patent 14 years
U.S. Cl. D25—62

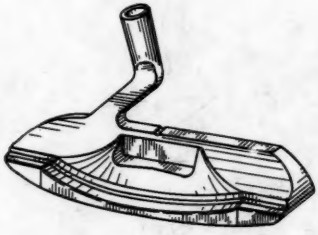


329,904
GOLF CLUB IRON
Geoffrey W. Gorman, Greer, S.C., assignor to Dunlop Slazenger Corporation, Greenville, S.C.
Filed May 29, 1990, Ser. No. 529,956
Term of patent 14 years
U.S. Cl. D21—220

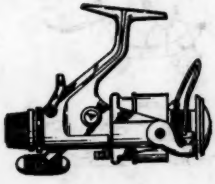
329,905
IRON GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Nov. 8, 1989, Ser. No. 433,171
The portion of the term of this patent subsequent to Sep. 12, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—220



329,906
GOLF PUTTER HEAD
Timothy R. Reed, Buffalo Grove, and James E. Karner, Grayslake, both of Ill., assignors to Tommy Armour Golf Company, Morton Grove, Ill.
Filed Jan. 24, 1990, Ser. No. 470,046
Term of patent 14 years
U.S. Cl. D21—219



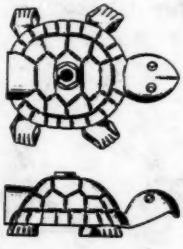
329,907
FISHING REEL
Toru Yui, Sakai, Japan, assignor to Shimano, Inc., Osaka, Japan
Filed Jan. 8, 1990, Ser. No. 461,792
Term of patent 14 years
U.S. Cl. D22—141



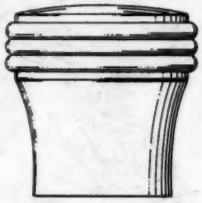
329,908
GRIP OF FISHING ROD
Kenji Onishi, Sakai, Japan, assignor to Shimano, Inc., Osaka, Japan
Filed Feb. 20, 1990, Ser. No. 482,684
Term of patent 14 years
U.S. Cl. D22—142

329,909
REEL SEAT FOR FISHING ROD
Mitsuyoshi Oyama, Musashino, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Nov. 23, 1990, Ser. No. 617,537
Claims priority, application Japan, May 31, 1990, 2-18334; Jun. 1, 1990, 2-18515
Term of patent 14 years
U.S. Cl. D22—142

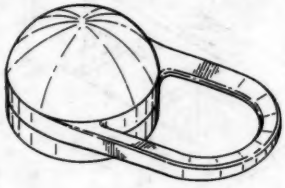
329,910
SPRINKLER HEAD
John A. Yanniell, Horseshoe Bay, and Milton C. Merka, Marble Falls, both of Tex., assignors to Wood Apple Inc., Mill Valley, Calif.
Filed Feb. 19, 1991, Ser. No. 657,545
Term of patent 14 years
U.S. Cl. D23—215



329,911
FAUCET KNOB
Holly K. Yost, Sherman Oaks, Calif., assignor to Emhart Inc., Newark, Del.
Continuation of Ser. No. 9,380, Jan. 30, 1987, abandoned. This application May 11, 1990, Ser. No. 521,002
Term of patent 14 years
U.S. Cl. D23—250

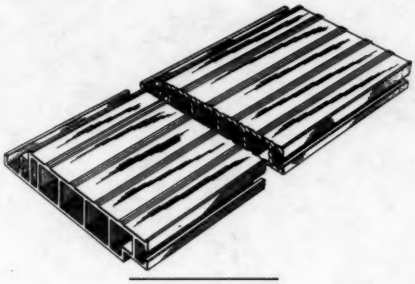


329,912
FAUCET HANDLE
Klaus Grohe, Schiltach, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany
Filed May 11, 1989, Ser. No. 350,536
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1988, M8803312.0
Term of patent 14 years
U.S. Cl. D23—252



329,913
TRANSLUCENT BLOCK
Harry A. Fleming, Jr., Smethport, Pa., and Donald E. Hock, Olean, N.Y., assignors to Pittsburgh Corning Corporation, Pittsburgh, Pa.
Filed Dec. 14, 1990, Ser. No. 627,968
Term of patent 14 years
U.S. Cl. D25—103

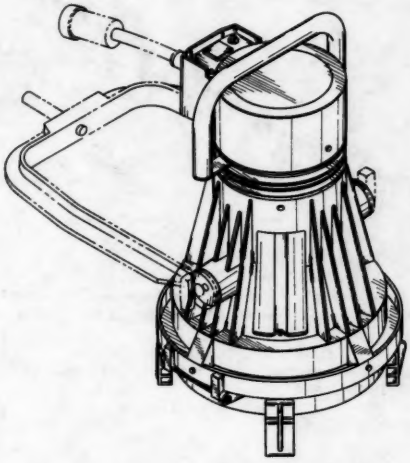
329,914
BOARD FOR FLOORING
Clément Veilleux, St-Basile-Le Grand, Canada, assignor to Les Profiles D'Extrusion Plastival Inc., Laval, Canada
Filed Mar. 26, 1990, Ser. No. 498,375
Term of patent 14 years
U.S. Cl. D25—138



329,915
PATIO BLOCK
Patrick Gutierrez, 600 Webster, Bay City, Mich. 48708
Filed Jun. 4, 1990, Ser. No. 532,983
Term of patent 14 years
U.S. Cl. D25—151

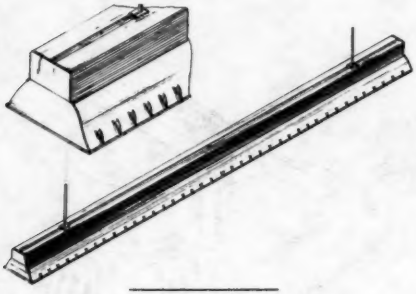
329,916
TABLE LAMP
Stephan Copeland, Venice, Calif., assignor to Flos S.p.A., Brescia, Italy
Filed Nov. 8, 1989, Ser. No. 434,821
Claims priority, application Italy, May 8, 1989, 6990/89[U]
Term of patent 14 years
U.S. Cl. D26—63

329,917
ARC LAMP FOR MOTION PICTURE PHOTOGRAPHY
Jean Galerne, 11 Rue Beauregard, Fresnel-Guerville 78930, France
Filed Dec. 15, 1989, Ser. No. 451,727
Term of patent 14 years
U.S. Cl. D26—63

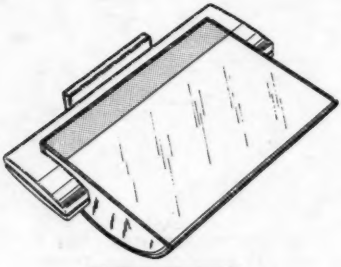


329,918
ADJUSTABLE DESK LAMP
Wang Y. Hsia, P.O. Box 82-144, Taipei, Taiwan
Filed Apr. 30, 1991, Ser. No. 693,419
Term of patent 14 years
U.S. Cl. D26—65

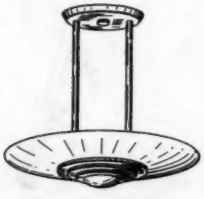
329,919
SUSPENDED FLUORESCENT LIGHTING FIXTURE
Gerhard Jahn, Secaucus, N.J., assignor to Zumtobel Lighting, Inc., Garfield, N.J.
Filed Jan. 15, 1991, Ser. No. 641,361
Term of patent 14 years
U.S. Cl. D26—77



329,920
WALL MOUNTED LUMINAIRE
Menno Dieperink, Amsterdam, and Stefanus F. W. Joosten, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 9, 1990, Ser. No. 506,651
Claims priority, application World Int. Prop. O., Oct. 30, 1989, DM/014.914
Term of patent 14 years
U.S. Cl. D26—87

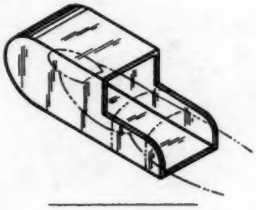


329,921
CEILING LAMP
Simon V. Benghozi, 406 Champagneur, Outremont, Quebec, Canada H2V 3P5
Filed Sep. 11, 1990, Ser. No. 581,094
Term of patent 14 years
U.S. Cl. D26—88

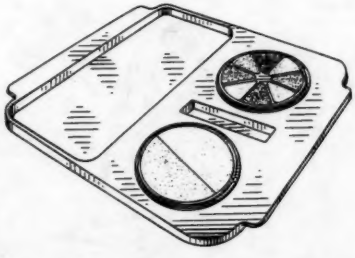


329,922
FLEXIBLE RAZOR CARTRIDGE
Evan N. Chen, Fairfield, and Frank A. Ferraro, Trumbull, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Apr. 10, 1990, Ser. No. 508,017
Term of patent 14 years
U.S. Cl. D28—47

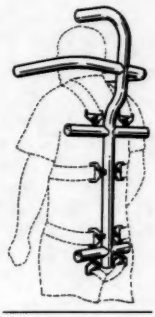
329,923
FINGERNAIL PROTECTOR GUARD
Marcine L. Thaxton, 10910 Canyon Mesa La., San Diego, Calif. 92126
Filed Aug. 22, 1990, Ser. No. 570,727
Term of patent 14 years
U.S. Cl. D28—56



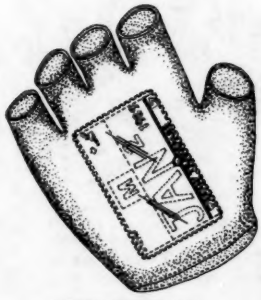
329,924
COMBINED COSMETIC TRAY AND CARTRIDGES FOR A COSMETIC PRODUCT
Carl M. Lombardi, Jr., Huntington, N.Y., assignor to Anna Young Associates, Ltd., Freeport, N.N.
Filed Jul. 2, 1990, Ser. No. 547,112
Term of patent 14 years
U.S. Cl. D28—77



329,925
FRAMEWORK FOR PROTECTING HUMAN SPINE DURING ACCIDENT
Warrick A. Tilury, 1730 Jackson Ave., Escalon, Calif. 95320, assignor to Warrick A. Tilury, Escalon, Calif.
Filed Dec. 26, 1989, Ser. No. 456,262
Term of patent 14 years
U.S. Cl. D29—10

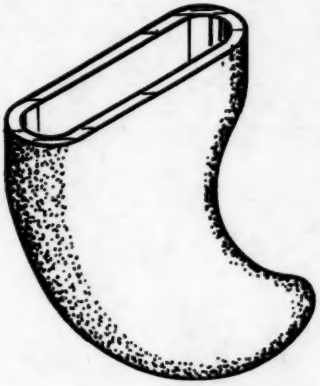


329,926
GLOVE FOR A TRANSIT CARD
Thelma C. Winder, 3118 N. Judson St., Philadelphia, Pa. 19132, assignor to Thelma C. Winder, Philadelphia, Pa.
Filed Feb. 17, 1989, Ser. No. 312,237
Term of patent 14 years
U.S. Cl. D29—22

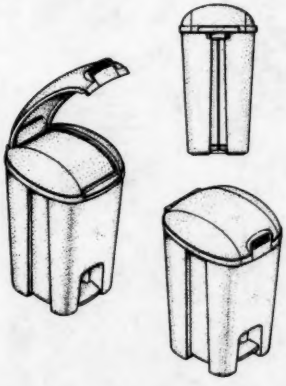


329,927
SANITARY GARMENT FOR AN ANIMAL
Miriam W. Thomas, 1883 Millson Cir., State College, Pa. 16801
Filed Jul. 30, 1990, Ser. No. 559,598
Term of patent 14 years
U.S. Cl. D30—145

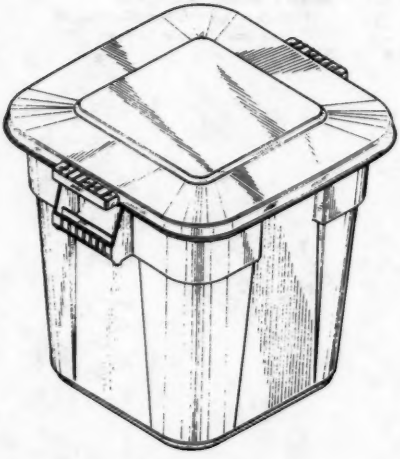
329,928
CLAW PROTECTOR FOR CATS
Toby Wexler, 458 "D" Heymann Blvd., Lafayette, La. 70503
Filed Aug. 22, 1991, Ser. No. 748,387
Term of patent 14 years
U.S. Cl. D30—146



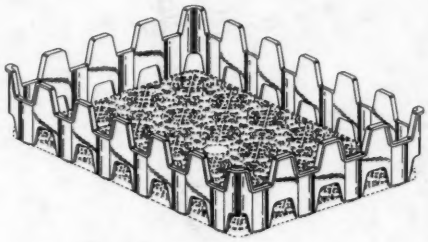
329,929
DIAPER CONTAINER
Roy E. Knoedler; Jeffery T. Samson, both of Boulder, and T. Brent Freese, Westminster, all of Colo., assignors to Gerry Baby Products Company, Denver, Colo.
Filed Sep. 4, 1991, Ser. No. 754,686
Term of patent 14 years
U.S. Cl. D32—37



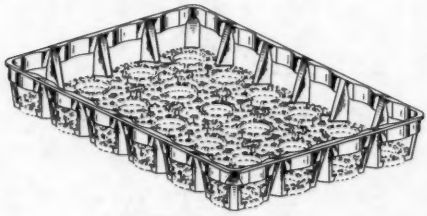
329,930
REFUSE CONTAINER WITH LID
Paul E. Delmerico, and Greg P. Terek, both of Winchester, Va., assignors to Rubbermaid Commercial Products-Inc., Winchester, Va.
Filed Mar. 14, 1990, Ser. No. 493,236
Term of patent 14 years
U.S. Cl. D34—7



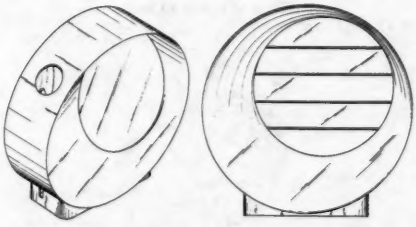
329,931
OUTER WALL STRUCTURE FOR A NESTABLE TRAY
William P. Apps, Anaheim, Calif., assignor to Rehrig-Pacific Company, Inc., Los Angeles, Calif.
Division of Ser. No. 724,433, Apr. 7, 1992, Pat. No. Des. 325,279, which is a continuation of Ser. No. 425,972, Oct. 20, 1989, abandoned. This application Mar. 29, 1990, Ser. No. 501,102
Term of patent 14 years
U.S. Cl. D34—40



329,932
OUTER WALL STRUCTURE FOR A NESTABLE TRAY
William P. Apps, Anaheim, Calif., assignor to Rehrig Pacific Company, Inc., Los Angeles, Calif.
Division of Ser. No. 357,068, May 23, 1989, Pat. No. Des. 317,670. This application May 25, 1990, Ser. No. 528,965
Term of patent 14 years
U.S. Cl. D34—40



329,933
COIN BANK
Jerzy Perkitny, Bay Village, Ohio, assignor to Mag-Nif, Inc., Mentor, Ohio
Filed May 18, 1990, Ser. No. 525,479
Term of patent 14 years
U.S. Cl. D99—35



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF SEPTEMBER, 1992

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Vesala, Reijo; and Vikman, Vesa, 5,151,010, Cl. 415-169.100.

A. H. Robins Company, Incorporated: *See*—
Taylor, Chandler R., Jr.; Cale, Albert D., Jr.; Johnson, David N.; and Stauffer, Harold F., Jr., 5,151,418, Cl. 514-210.000.

Aaronson, Alan M.: *See*—
Bright, Danielle A.; and Aaronson, Alan M., 5,151,539, Cl. 558-128.000.

AB Volvo: *See*—
Alfredsson, Sverker, 5,150,628, Cl. 74-330.000.

Abbott Laboratories: *See*—
Best, Robert J.; Larkin, Mark E.; and Zaha, Juergen H., 5,151,090, Cl. 604-192.000.
Dombrowski, James E.; and Mattingly, Phillip G., 5,151,518, Cl. 546-107.000.
Rosenberg, Saul H.; and Denissen, Jon F., 5,151,422, Cl. 514-252.000.
Sham, Hing L.; Norbeck, Daniel W.; Kempf, Dale J.; and Zhao, Chen, 5,151,438, Cl. 514-357.000.

Abe, Akira; Mihayashi, Keiji; and Ichijima, Seiji, to Fuji Photo Film Co., Ltd. Method for processing a silver halide color photographic material. 5,151,344, Cl. 430-383.000.

Abe, Kazuyuki, to Nitsuko Corporation. Key telephone system. 5,151,933, Cl. 379-159.000.

Abe, Makoto: *See*—
Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori; and Ito, Toshiyuki, 5,151,910, Cl. 372-31.000.

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Abe, Masayuki: *See*—
Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000.

Abe, Takefumi: *See*—
Koyama, Takeshi; and Abe, Takefumi, 5,151,549, Cl. 562-467.000.

Abe, Toshiyuki: *See*—
Arikawa, Tetsuro; and Abe, Toshiyuki, 5,150,950, Cl. 303-100.000.

Abele, John E.; Lennox, Charles E.; Nardella, Paul C.; and Joshi, Sharad H., to Boston Scientific Corporation. Heating catheters. 5,151,100, Cl. 606-28.000.

Abraham, Robert L.; Priven, Michael P.; and Moorman, Thomas P., to International Business Machines Corporation. Recovery objects in an object oriented computing environment. 5,151,987, Cl. 395-575.000.

Adachi, Susumu: *See*—
Kiri, Motosada; and Adachi, Susumu, 5,151,588, Cl. 250-208.100.

Adachi, Yuuma, to Fuji Photo Film Co., Ltd. Method for compressing and extending image signals. 5,151,795, Cl. 358-448.000.

Adams, Brian: *See*—
Cunningham, Linda J.; Adams, Brian; and Barham, William, 5,150,725, Cl. 131-365.000.

Adams, James; and Meczkowski, Frank J., to Campbell Soup Company. Process for packaging acidified vegetable. 5,151,286, Cl. 426-324.000.

Adams, John T.; and Tinsley, Timothy M., to Honeywell Inc. Integrated low voltage detect and watchdog circuit. 5,151,854, Cl. 364-184.000.

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Welply, Joseph K.; Adams, Steven P.; and Gordon, Jeffrey I., 5,151,445, Cl. 514-557.000.

Adamson, John, to Sab Wabco Holdings, B.V. Wheels incorporating brake discs. 5,150,774, Cl. 188-218.0XL.

Adcock, Marty E.: *See*—
Kreinberg, Earl R.; and Adcock, Marty E., 5,151,560, Cl. 174-94.00R.

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Vincent, Michel; Remond, Georges; Portevin, Bernard; Herve, Yolande; and Lepagnol, Jean, 5,151,432, Cl. 514-299.000.

Adkins, Wayne B.; and Roncero, Jose I., to Philip Morris Incorporated. Apparatus and method for removing tobacco shreds from a cigarette filter. 5,150,719, Cl. 131-96.000.

Advanced Dynamics Corporation: *See*—
McAllister, Michael J., 5,150,786, Cl. 206-328.000.

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Murphy, James V., 5,151,039, Cl. 439-70.000.

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Agrawal, Om P., 5,151,623, Cl. 307-465.000.
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Boquillon, Jean-Pierre; Berger, Hubert; and Bresson, Philippe, 5,151,134, Cl. 134-1.000.

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Roederer, Antoine; and Van't Klooster, Cornelis, 5,151,706, Cl. 342-372.000.

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Hayashi, Teruyuki; Kobayashi, Toshiaki; and Tanaka, Masato, 5,151,538, Cl. 556-431.000.
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Coan, Thomas E.; and Ahlen, Steven P., 5,151,963, Cl. 385-88.000.

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Handa, Kazuko; Igarashi, Yasuyuki; Ahmad, Mahammad N.; and Hakomori, Sen-Itiroh, 5,151,360, Cl. 435-240.200.

Ahola, Pentti V.: *See*—
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Aigo, Seiichiro. Lid member having a filter medium for a spin dryer. 5,150,532, Cl. 34-58.000.

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Greenwald, C. Kent; Gray, Leslie M.; Read, R. Bart; and Stevens, William, 5,151,014, Cl. 416-237.000.

Aisin AW Co., Ltd.: *See*—
Yamashita, Mitugu; Kawamoto, Mutsumi; and Inagaki, Hidemitsu, 5,150,763, Cl. 180-252.000.

Aisin Seiki K.K.: *See*—
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Aisin Seiki Kabushiki Kaisha: *See*—
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Akagawa, Keiichi: *See*—
Ohmine, Toshimitsu; Akagawa, Keiichi; and Ishihata, Akira, 5,151,133, Cl. 118-725.000.

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Akama, Hiroshi: *See*—
Kato, Yasuyoshi; Konishi, Kunihiko; Teshima, Nobue; Matsuda, Toshiaki; and Akama, Hiroshi, 5,151,256, Cl. 423-210.000.

Akashi, Akira; and Kadohara, Terutake, to Canon Kabushiki Kaisha. Automatic focusing apparatus. 5,151,732, Cl. 354-402.000.

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Akin, Timur; Myers, Bruce A.; Maki, William M.; and Palanisamy, Ponnusamy, to Delco Electronics Corporation. Interface device for thermally coupling an integrated circuit to a heat sink. 5,151,777, Cl. 357-81.000.

Akune, Shinichi: *See*—
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Akutsu, Eiichi; Shoji, Yoshio; Soga, Hiroo; and Ando, Shigehito, to Fuji Xerox Co., Ltd. Device for thermally fusing an unfused image on an image holding member. 5,151,719, Cl. 346-160.100.

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Buback, Michael; Hader, Josef; Voegele, Hans-Peter; and Al-Massri, ZaKarya, 5,151,533, Cl. 552-625.000.

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Consani, Alberto, 5,150,848, Cl. 242-56.00R.
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Medlicott, Mark, 5,151,927, Cl. 375-119.000.
Alcatel Espace: *See*—
Roques, Daniel; Pouysegur, Michel; and Cazaux, Jean-Louis, 5,151,669, Cl. 333-81.00R.
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Alcatel Network Systems, Inc.: *See*—
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Alcatel Transmission par Faisceaux Hertziens: *See*—
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Alcon Laboratories, Inc.: *See*—
DuPriest, Mark T.; Conrow, Raymond E.; and Kuzmich, Daniel, 5,151,544, Cl. 560-10.000.
Alessandri, Louis A., Jr. Tubular choke wrench apparatus. 5,151,552, Cl. 42-90.000.
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Allen-Bradley Company, Inc.: *See*—
Lombardi, Steven A.; and Marasch, Richard D., 5,151,642, Cl. 318-779.000.
Allen Group Inc., The: *See*—
DeRisi, Joseph F.; Winston, Lonnie E.; Harrison, Dudley; and Rawson, Ken, 5,150,520, Cl. 29-890.013.
Allen, James D.; and King, Steven A., to International Business Machines Corporation. Nonvolatile memory management in a data processing network. 5,151,990, Cl. 395-650.000.
Allendorf, Stephan C.; and Dair, Thomas M., to Corning Incorporated. Compression joint for eyeglasses. 5,151,721, Cl. 351-121.000.
Allergan, Inc.: *See*—
Bhaumik, Debabrata; and Chen, Patrick K., 5,151,106, Cl. 8-507.000.
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Allied-Signal Inc.: *See*—
Draskovich, Barry S., 5,151,325, Cl. 428-325.000.
Emerson, Terence P.; Bescoby, Frank A.; Taylor, Colin M.; and Payne, George K., 5,151,022, Cl. 423-245.300.
Ozenrider, Bryce C.; Long, David J.; and Mares, Frank, 5,151,477, Cl. 526-216.000.
Roos, Mark G., 5,151,703, Cl. 342-199.000.
Sedath, Robert H.; Taylor, Donald R.; and White, Lloyd S., 5,151,183, Cl. 210-500.410.
Allison, A. Christopher; and Jaffe, Richard A., to Leland Stanford Junior University, The Board of Trustees of the. Safety needle and syringe assembly. 5,151,088, Cl. 604-192.000.
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Alps Electric Co., Ltd.: *See*—
Ichihara, Akira, 5,151,836, Cl. 360-99.080.
Aluminum Company of America: *See*—
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Alvarez-Avila, Carlos: *See*—
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Alvarez, Vincent H.; and Dendramis, Nancy C., to Key, Sally M. Dual purpose unitized pack. 5,150,824, Cl. 224-151.000.
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Theeuwes, Felix; and Yum, Su I., 5,151,093, Cl. 604-892.100.
Amagat, Michel: *See*—
Valy, Yves H. G.; Coquet, Pascal D.; and Amagat, Michel, 5,150,741, Cl. 141-18.000.
Amano, Fumio: *See*—
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Bennett, Robert A., 5,150,540, Cl. 43-43.120.
Amemiya, Hideo: *See*—
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Amemiya, Koji: *See*—
Takeuchi, Tatsuo; and Amemiya, Koji, 5,151,313, Cl. 428-192.000.
American Cyanamid Company: *See*—
Bloom, Jonathan D.; Claus, Thomas H.; DeVries, Vern G.; Dolan, Jo A.; and Dutia, Minu D., 5,151,439, Cl. 514-376.000.
Kameswaran, Venkataraman; and Barton, Jerry M., 5,151,536, Cl. 548-530.000.
McCoy, Kevin M., 5,151,501, Cl. 530-399.000.
O'Hara, Bryan M., 5,151,361, Cl. 435-240.200.
American Home Products Corporation: *See*—
Caufield, Craig E.; and Schiehser, Guy A., 5,151,413, Cl. 514-63.000.
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Talwar, Ashok K., 5,152,010, Cl. 455-136.000.
Amgen Inc.: *See*—
Souza, Lawrence M.; and Boone, Thomas C., 5,151,511, Cl. 536-27.000.
Amick, David R., to Rohm and Haas Company. S-substituted beta-thioacrylamide biocides and fungicides. 5,151,447, Cl. 514-627.000.
Amino, Hirokazu: *See*—
Kamiyama, Hiroyasu; and Amino, Hirokazu, 5,151,102, Cl. 606-51.000.
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El-Hibri, Mohammad J.; Jack, Gregory S.; Kelly, William E.; and Patel, Sanjay R., 5,151,462, Cl. 524-405.000.
Kukes, Simon G.; Clark, Frederick T.; Hopkins, P. Donald; and Green, Lisa M., 5,151,172, Cl. 208-144.000.
Magee, Thomas J.; Leung, Charles S.; and Press, Richard L., 5,151,135, Cl. 134-1.000.
Moskowitz, Larry N.; and Lindley, Donald J., 5,151,308, Cl. 428-35.800.
Qureshi, Shahid P.; and Gardner, Hugh C., 5,151,471, Cl. 525-423.000.
AMP Incorporated: *See*—
Cravens, David M.; Denlinger, Keith R.; Gryzbowski, Richard W.; and Myer, John M., 5,151,045, Cl. 439-271.000.
Korsunky, Iosif; and Grabbe, Dimitry G., 5,151,046, Cl. 439-326.000.
Kreinberg, Earl R.; and Adcock, Marty E., 5,151,560, Cl. 174-94.00R.
Nagamine, Akira, 5,151,051, Cl. 439-557.000.
Phillips, Michael J., 5,151,047, Cl. 439-333.000.
Scholz, James P.; and Stahl, Daniel E., 5,151,050, Cl. 439-456.000.
Warner, Gary N.; White, Jason L.; Haley, Edmund J.; Savitsky, Wallace R.; and Schaffer, Ronald R., 5,151,960, Cl. 385-53.000.
Amphenol Corporation: *See*—
Briones, Francisco R.; and Boutros, Kamal S., 5,151,054, Cl. 439-620.000.
Anami, Koretake: *See*—
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000.
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Bogenhagen, David R., 5,150,983, Cl. 403-402.000.
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Anderson, David M.: *See*—
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Anderson, Leslie B., to Medico International, Inc. Absorbent assembly for use as a thermal pack. 5,150,707, Cl. 128-402.000.
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Griffin, Roy A., III; Esserman, James N.; and Anderson, Steven E., 5,151,938, Cl. 380-43.000.
Ando, Kunio: *See*—
Kabuto, Nobuaki; Igarashi, Mayumi; Inoue, Fumio; and Ando, Kunio, 5,151,689, Cl. 340-784.000.
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Akutsu, Eiichi; Shoji, Yoshio; Soga, Hiroo; and Ando, Shigehito, 5,151,719, Cl. 346-160.100.
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Khoury, Adib I., 5,151,096, Cl. 606-15.000.
Anilionis, Algis: *See*—
Colbert, Donald A.; and Anilionis, Algis, 5,151,350, Cl. 435-69.100.
Ansley, David A., to Hughes Aircraft Company. System and technique for making holographic projection screens. 5,151,799, Cl. 359-11.000.
Anton, Rainer; and Harneit, Dieter, to Deutsche Fibrit Gesellschaft Abers & Dr Muller GmbH. Process of making contoured vehicle internal panelling supports. 5,151,226, Cl. 264-25.000.
Antunez, Bruce A. Boosted differential pressure-type tank valve. 5,150,732, Cl. 137-414.000.
Aoki, Hiroyuki; Suzuki, Tadashi; Katahata, Toshio; Haino, Mutsuo; Nishimura, Genshiro; Kaya, Hiroshi; Tamura, Kozaburo; and Isoda, Takeshi, to Toa Nenryo Kogyo Kabushiki Kaisha. Silicon nitride-based fibers and composite material reinforced with fibers. 5,151,390, Cl. 501-95.000.
Aoki, Kaoru: *See*—
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Aomi, Hideki: *See*—
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 5,151,206, Cl. 252-62.510.
Aoyama, Keisuke: *See*—
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Aoyama, Shunichi, to Nissan Motor Co., Ltd. Direct injection diesel engine. 5,150,677, Cl. 123-302.000.

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Apple Computer, Inc.: *See—*
Bailey, Robert L.; and Howard, Brian D., 5,151,997, Cl. 395-800.000.
Cappels, Richard D., 5,151,635, Cl. 315-370.000.
Sander, Wendell; and Sander, Brian, 5,151,985, Cl. 395-500.000.

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Stec, Wojciech J.; Uznanski, Bogdan; Bergot, B. John; Hirschbein, Bernard L.; and Fearon, Karen L., 5,151,510, Cl. 536-27.000.

Applied Materials, Inc.: *See—*
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Arahira, Masato: *See—*
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Arai, Hideki; Kawai, Makoto; and Miyai, Kenji, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Exhaust gas cleaning device for internal combustion engine. 5,151,254, Cl. 422-180.000.

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Enoki, Takatomo; Shigekawa, Naoteru; and Arai, Kunihiro, 5,151,757, Cl. 357-22.000.

Araki, Yozo; Ito, Isamu; Sugimura, Tohru; Suzuki, Migaku; and Ochi, Mitsuzo, to Mitsubishi Jukogyo Kabushiki Kaisha; and Uni-Charm Corporation. Method and apparatus for packaging resiliently deformable articles. 5,150,562, Cl. 53-438.000.

Aramaki, Takashi: *See—*
Ueda, Toru; Ishizuka, Yasushi; Togawa, Fumio; and Aramaki, Takashi, 5,151,951, Cl. 382-19.000.

Arato, Mihaly: *See—*
Perenyi, Andras; Utpal, Goswami; Arato, Mihaly; Frescka, Ede; Knoll, Jozsef; and Bela, D. Arpad, 5,151,419, Cl. 514-226.200.

Araya, Junji: *See—*
Ohzeki, Yukihiro; Araya, Junji; Ishiyama, Tatsunori; Sato, Yasushi; and Nakahata, Kimio, 5,151,736, Cl. 355-208.000.

Arco Chemical Technology, L.P.: *See—*
Le-Khac, Bi, 5,151,465, Cl. 524-549.000.
Yang, Lau S., 5,151,464, Cl. 524-449.000.

Argent, Ronald D.; Ruthers, Richard A.; and Webber, Roy A. Electrode blocks and block assemblies. 5,151,918, Cl. 373-27.000.

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Arizumi, Masato; Ozawa, Norio; Haruta, Yasuo; and Mabuchi, Yoshinobu, to Oki Electric Industry Co., Ltd. Method and system for selectively communicating with a telephone or a non-telephone terminal through a public telephone network. 5,151,932, Cl. 379-106.000.

ARK, Inc.: *See—*
Cole, William R., Jr.; Sanborn, Charles H., III; and Clanton, J. Dwight, 5,151,077, Cl. 493-353.000.

Armco Steel Company, L.P.: *See—*
Robbins, Douglas J.; Gosselin, Cynthia A.; and Myers, Frederick A., 5,151,297, Cl. 427-46.000.

Arndt, Otto; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the production of high-purity tetrachloro-1,4-benzoquinone. 5,151,532, Cl. 552-308.000.

Arndt, Ulrich; Luneburg, Peter; Marquardt, Kurt; Pierags, Hans-Joachim; and Zeuschner, Ulrich, to Wilhelm Fette GmbH, Firma. Pelletizing machine. 5,151,280, Cl. 425-186.000.

Arnold, Raymond E.: *See—*
Heinsohn, Henry G.; Lorch, Jeffrey D.; Hayenga, Kirk J.; and Arnold, Raymond E., 5,151,358, Cl. 435-226.000.

Artieri, Alain, to SGS-Thomson Microelectronics S.A. Device for converting a line scanning into a vertical saw tooth scanning through stripes. 5,151,976, Cl. 395-166.000.

Arvan, Inc.: *See—*
Silzer, Elmar; and Leung, Emil Y., 5,150,941, Cl. 296-152.000.

Asahi Kogaku Kogyo K.K.: *See—*
Oono, Masahiro; and Chiba, Tohru, 5,151,752, Cl. 356-128.000.

Asakura, Tsutou: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; and Uchiyama, Yuji, 5,151,781, Cl. 358-45.000.

Asano, Koin; Tagawa, Kenichi; Nakagawa, Hiroshi; and Wakahara, Hiroyuki, to Kanebo, Ltd. Leather-like material having excellent water vapor permeability and suppleness and its manufacture. 5,151,240, Cl. 264-284.000.

Asea Brown Boveri AB: *See—*
Nettelbladt, Hans K.; and Widman, Karl M., 5,151,756, Cl. 357-17.000.

Asea Brown Boveri Ltd.: *See—*
Huppi, Michael, 5,151,766, Cl. 357-38.000.

Ashman, William P.: *See—*
Hsu, Fu-Lian; and Ashman, William P., 5,151,526, Cl. 548-335.000.

Ashton, Jefferson P.: *See—*
Gaidry, John E.; Quebedeaux, Larry J.; Donovan, Joseph F.; and Ashton, Jefferson P., 5,150,753, Cl. 166-278.000.

Asics Corporation: *See—*
Yuki, Syoji; Tokui, Yasuyuki; Nishiuchi, Kihachiro; Wada, Kenichi; Suzue, Masayoshi; and Morimoto, Takuo, 5,150,905, Cl. 273-218.000.

Aslam, Mohammad; and Davenport, Kenneth G., to Hoechst Celanese Corporation. Thio carbamates and their derivatives. 5,151,540, Cl. 558-232.000.

Aso, Tsuyoshi, to Oki Electric Industry Co., Ltd. Dielectric isolation substrate. 5,151,768, Cl. 357-51.000.

Aspden, Harold. Electric surface heating and apparatus therefor. 5,151,577, Cl. 219-528.000.

Asten Group, Inc.: *See—*
Durkin, Thomas B.; and Biasone, Frank, 5,151,316, Cl. 428-213.000.

AT&T Bell Laboratories: *See—*
Andrews, Jack E.; Harmel, Roman J.; Lochkovic, Gregory A.; and Rotoloni, Francis A., 5,151,306, Cl. 427-434.500.
Bass, Benjamin A., 5,150,789, Cl. 206-396.000.
Degani, Yinon; and Morris, John R., Jr., 5,150,832, Cl. 228-224.000.
Hunt, Rodney J.; and Kip, Ruloff F., Jr., 5,150,852, Cl. 242-157.00R.
Knepper, Jonathan D.; and Moll, Kenneth P., 5,150,829, Cl. 228-104.000.
Krol, Denise M.; and Simpson, Jay R., 5,151,817, Cl. 359-328.000.
Lavagetto, Fabio; and Leonardi, Riccardo, 5,151,784, Cl. 358-136.000.

Atarashi, Junko: *See—*
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Atkin, John: *See—*
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Atlantic Richfield Company: *See—*
Burton, Anthony R.; Mitchell, Monte K.; and Hernandez, Raymond, 5,150,751, Cl. 166-81.000.
Kingman, John E. E., 5,151,882, Cl. 367-82.000.

Atlas Roll-Lite Door Corporation: *See—*
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Atochem: *See—*
Spitz, Roger; Malinge, Jean; and Joly, Jean-Francois, 5,151,396, Cl. 502-104.000.

Atomic Energy of Canada Limited: *See—*
Craw, Marjory T.; McCrimmon, Kevin D.; and Deschenes, Lyse L., 5,151,402, Cl. 502-401.000.

Atsugi Unisia Corporation: *See—*
Suga, Seiji, 5,150,671, Cl. 123-90.170.

Atsumi, Kiminori; Saito, Tomoki; and Komori, Masaaki, to Kabushiki Kaisha Sangi. Process for producing an antibacterial ceramic material. 5,151,122, Cl. 106-35.000.

Aubry, Michael E.: *See—*
Myslicki, Robert J.; Khalid, Hecham R.; and Aubry, Michael E., 5,150,933, Cl. 292-216.000.

Aucoin, Jack: *See—*
Walker, James P.; Aucoin, Jack; and Drew, Randall, 5,151,962, Cl. 385-86.000.

Auer, Johann; Pirklbauer, Wilfried; Ramaseder, Norbert; and Smejkal, Hellmuth, to Voest-Alpine Industrieanlagenbau G.m.b.H. Metallurgical vessel. 5,151,243, Cl. 266-78.000.

Aupperlee, Patricia C.; and Wiswell, Beth R. Vehicular child seat cover. 5,150,945, Cl. 297-184.000.

Aurinco Holdings Limited: *See—*
Ven, Kari K. M.; Ven, Petri A. G.; Ven, Irja L. L. M.; Ven, Timo; and Ven, Juha, 5,151,827, Cl. 359-848.000.

Austin, Curtiss M.; Darolia, Ramgopal; O'Hara, Kevin S.; and Ross, Earl W., to General Electric Company. Nickel-based single crystal superalloy and method of making. 5,151,249, Cl. 420-445.000.

Austin, George K., Jr.; and Johannes, Sandor. Valve assembly with flow control. 5,150,880, Cl. 251-149.300.

Austin, John S.; Piro, Ronald A.; and Stout, Douglas W., to International Business Machines Corporation. CMOS off chip driver circuit. 5,151,619, Cl. 307-473.000.

Avery, Neal H. Grapple assembly for attachment to workhead. 5,150,936, Cl. 294-104.000.

AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. Hans List: *See—*
Fischer, Christof D.; Petutschnig, Wolfgang; and Wojik, Karl, 5,150,672, Cl. 123-90.220.

Awano, Namoi: *See—*
Suzuki, Yasutoshi; Awano, Namoi; Hoshino, Kouichi; and Inuzuka, Hajime, 5,151,764, Cl. 357-27.000.

Azhari, Haim: *See—*
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Azuma, Toshiaki: *See—*
Suzuki, Aimi; Azuma, Toshiaki; Kimura, Shigeaki; and Hosogi, Yasuyuki, 5,151,404, Cl. 503-200.000.

Azzara, Sauveur A.; and Coutant, Herve G. F., to Societe Nationale Industrielle et Aerospatiale. Method for forming convex non-extractable formed pieces made of a composite material. 5,151,236, Cl. 264-257.000.

B. F. Goodrich Company, The: *See—*
Jordan, Robert E.; and Hughes, Michael J., 5,150,831, Cl. 228-184.000.

B-J Trading Limited: *See—*
Hara, Akira, 5,150,653, Cl. 101-483.000.

B & R Electrical PLC: *See—*
Knights, Douglas S., 5,151,841, Cl. 361-86.000.

B.S.A. Guns (UK) Limited: *See*—
Wackrow, Roger D.; White, Kenneth W.; and Jones, Harold C., 5,150,701, Cl. 124-67.000.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Kato, Yasuyoshi; Konishi, Kunihiko; Teshima, Nobue; Matsuda, Toshiaki; and Akama, Hiroshi, 5,151,256, Cl. 423-210.000.

Babczinski, Peter: *See*—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000.

Babiarz, Joseph E.; and Rutsch, Werner, to Ciba-Geigy Corporation. Substituted 1,4-diamino-2-butyne or propargylamine as stabilizers for compositions. 5,151,459, Cl. 524-255.000.

Babiuk, Lorne; van den Hurk, Sylvia; Zamb, Tim; and Fitzpatrick, David, to University of Saskatchewan. Bovine herpesvirus type 1 polypeptides and vaccines. 5,151,267, Cl. 424-89.000.

Bach, Ulf-Eiel F.; Rueter, Rodney N.; and Taylor, John N., to Northland Aluminum Products, Inc. Faucet connected water filter. 5,151,179, Cl. 210-250.000.

Bach, Volker; Hansen, Guenter; Lamm, Gunther; and Sens, Ruediger, to BASF Aktiengesellschaft. Phenoneazo dyes. 5,151,506, Cl. 534-772.000.

Backlund, Dale J.: *See*—
Simeroth, David L.; Brink, David S.; Willis, Reid S.; and Backlund, Dale J., 5,150,601, Cl. 73-23.410.

Backstrom, Reijo J.; Heinola, Kalevi E.; Nore, Pentti T.; Pystynen, Jarmo J.; Honkanen, Erkki J.; and Haikala, Heimo O., to Orion Corporation/Orion Pharmaceutica. Substituted pyridazinones. 5,151,420, Cl. 514-247.000.

Bade, Jeffrey M.: *See*—
Glaser, R. Steven; and Bade, Jeffrey M., 5,151,866, Cl. 364-483.000.

Badger, Scott L.; Braun, John P.; and Goodman, Sperry H., to Boeing Aerospace and Electronics. System and method of shaping an antenna radiation pattern. 5,151,705, Cl. 342-368.000.

Badiali, Roberto: *See*—
Colli, Luigi; and Badiali, Roberto, 5,150,845, Cl. 242-35.50A.

Bagley, Scott; Greenlee, William J.; Dhanoa, Daljit S.; and Patchett, Arthur A., to Merck & Co., Inc. Angiotensin II antagonists incorporating an indole or dihydroindole. 5,151,435, Cl. 514-303.000.

Bailey, Richard G.: *See*—
Williams, Rick L.; Leggott, Merton R.; and Bailey, Richard G., 5,151,285, Cl. 426-241.000.

Bailey, Robert L.; and Howard, Brian D., to Apple Computer, Inc. Computer with adaptable video circuitry. 5,151,997, Cl. 395-800.000.

Baillet, Gerard, to SAT (Societe Anonyme de Telecommunications). Scanning device and application thereof to analysis devices. 5,151,815, Cl. 359-220.000.

Bakay, Arpad: *See*—
Bergmann, Gyorgy; Hivessy, Geza; Homola, Tamas; Bakay, Arpad; and Horvath, Mihaly, 5,150,749, Cl. 165-115.000.

Baker, Gordon M.: *See*—
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Baker Hughes Incorporated: *See*—
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Gaidry, John E.; Quebedeaux, Larry J.; Donovan, Joseph F.; and Ashton, Jefferson P., 5,150,753, Cl. 166-278.000.

Baker, John L.: *See*—
Major, Kenneth E.; Baker, John L.; and Braunagel, David K., 5,150,769, Cl. 184-31.000.
Major, Kenneth E.; Baker, John L.; and Braunagel, David K., 5,150,975, Cl. 384-465.000.

Bakhit, Gabriel G.; and Shambrook, Kevin P., to Hughes Aircraft Company. Flip interconnect. 5,151,388, Cl. 437-209.000.

Baldini, Todd H.: *See*—
Hamberg, James P.; Baldini, Todd H.; Smith, Stanley E.; Collins, Wendell, Jr.; and Longhouse, Richard E., 5,150,886, Cl. 267-220.000.

Baltimore Aircoil Company: *See*—
Smith, Glenn W., 5,150,581, Cl. 62-115.000.

Baltimore Therapeutic Equipment Co.: *See*—
Jain, Sanjeev; and Vermette, John E., 5,151,071, Cl. 482-101.000.

Balzano, Quirino; and Stengel, Robert E., to Motorola, Inc. Tunable superconductive antenna. 5,151,709, Cl. 343-741.000.

Bambara, Joseph E., to Servo Corporation of America. Acoustic bearing defect detector. 5,150,618, Cl. 73-660.000.

Bandy, Michael J.; Byerly, Roy H.; and Spoonmore, Robert T., to Eli Lilly and Company. Containment valve that allows contamination free transfer. 5,150,735, Cl. 137-614.060.

Bang, Nils U.; Beckmann, Robert J.; Jaskunas, S. Richard; Lai, Mei-Huei T.; Little, Sheila P.; Long, George L.; and Santerre, Robert F., to Eli Lilly and Company. Methods of using recombinant human protein C. 5,151,268, Cl. 424-94.640.

Banks, William B.: *See*—
Earl, Harold A.; and Banks, William B., 5,151,238, Cl. 264-136.000.

Bantien, Frank: *See*—
Marek, Jiri; Bantien, Frank; Haack, Dietmar; and Warth, Martin, 5,151,763, Cl. 357-26.000.

Bardin, Roland: *See*—
Lucas, Christian; and Bardin, Roland, 5,150,912, Cl. 280-605.000.

Barham, William: *See*—
Cunningham, Linda J.; Adams, Brian; and Barham, William, 5,150,725, Cl. 131-365.000.

Barkan, Edward: *See*—
Metlitsky, Boris; Swartz, Jerome; Barkan, Edward; Shepard, Howard; Goren, David; and Biuso, Tony, 5,151,580, Cl. 235-462.000.

Barre, Edith: *See*—
Reveilleau, Pierre; Mahuzier, Georges; Chalom, Joseph; Farinotti, Robert; Tod, Michel; and Barre, Edith, 5,151,517, Cl. 546-66.000.

Barry, Robert M., to CFR Corporation. Filter system for wet vacuum cleaning apparatus. 5,151,181, Cl. 210-338.000.

Bartholomew, Roger F.; and Sadd, Andrea L., to Corning Incorporated. Solution doping of porous preforms. 5,151,117, Cl. 65-3.120.

Barton, Jerry M.: *See*—
Kameswaran, Venkataraman; and Barton, Jerry M., 5,151,536, Cl. 548-530.000.

Bartos, Andrew L.: *See*—
Morris, Robert L.; and Bartos, Andrew L., 5,150,629, Cl. 74-337.500.

BASF Aktiengesellschaft: *See*—
Bach, Volker; Hansen, Guenter; Lamm, Gunther; and Sens, Ruediger, 5,151,506, Cl. 534-772.000.
Beck, Karin H.; Etzbach, Karl-Heinz; and Schmidt, Hans-Werner, 5,151,516, Cl. 546-37.000.
Gaeng, Manfred; Saukel, Heinz; Hoffmann, Wolfgang; and Koenig, Josef, 5,151,523, Cl. 548-217.000.
Hermeling, Dieter; Degner, Dieter; Harreus, Albrecht; Goetz, Norbert; Wild, Jochen; Theobald, Hans; and Wolf, Bernd, 5,151,548, Cl. 560-255.000.
Joerg, Klaus; Kummer, Rudolf; and Mueller, Franz-Josef, 5,151,541, Cl. 558-277.000.
Mueller, Stefan; Theobald, Hans; Wolf, Bernd; Hofmeister, Peter; Kardorff, Uwe; and Kuenast, Christoph, 5,151,441, Cl. 514-378.000.
Schlecker, Rainer; Teschendorf, Hans-Juergen; and Unger, Liliane, 5,151,437, Cl. 514-320.000.

Bass, Benjamin A., to AT&T Bell Laboratories. Package of elongated strand material and carton blank thereof. 5,150,789, Cl. 206-396.000.

Basseggio, Narcizo O. System and process of compressing miscible fluids. 5,150,586, Cl. 62-468.000.

Bauer, Daniel; Leroy, Frederic; Braque, Gerard; and Charon, Andre , to L'Oreal. Compression device, particularly for the pressure filling of a container. 5,151,015, Cl. 417-415.000.

Baumeister, Joachim; and Schrader, Hartmut, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Methods for manufacturing foamable metal bodies. 5,151,246, Cl. 419-2.000.

Baust, Heinrich: *See*—
Hitz, Hans; Schaefer, Rolf; Baust, Heinrich; and Gross, Wolfgang, 5,151,522, Cl. 548-112.000.

Baxi, Indra R.; and Johnson, Tom W., to Nitrojection Corporation. Plastic injection molding nozzle with gas assist. 5,151,278, Cl. 425-130.000.

Bayer Aktiengesellschaft: *See*—
Fennhoff, Gerhard; Jakob, Wolfgang; Ehlert, Manfred; and Freitag, Dieter, 5,151,452, Cl. 521-48.000.
Heinz, Hans-Detlef; Pielartzik, Harald; Reinking, Klaus; Meyer, Rolf-Volker; and Korte, Siegfried, 5,151,458, Cl. 524-190.000.
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000.
Noll, Klaus; Pedain, Josef; Zorn, Bruno; and Schmid, Rosemarie, 5,151,329, Cl. 428-423.400.
Podszun, Wolfgang; Muller, Michael; Cramer, Wilfried; and Rehbold, Bodo, 5,151,480, Cl. 526-279.000.
Schmalstieg, Lutz; Hihlein, Peter; Pedain, Josef; and Wieczorrek, Wolfhart, 5,151,484, Cl. 528-45.000.

Bayley, Robert D.; and Hoffend, Thomas R., to Xerox Corporation. Toner and developer compositions with charge enhancing additives. 5,151,338, Cl. 430-106.000.

Baylor Research Institute: *See*—
Harms, Steven E.; Flamig, Duane P.; and Griffey, Richard H., 5,151,655, Cl. 324-309.000.

Beach, Marvin F.: *See*—
Curry, Ernest W.; and Beach, Marvin F., 5,151,288, Cl. 426-474.000.

Beaud, Paul A.: *See*—
Bi, Junging; Beaud, Paul A.; Schutz, Jurg A.; Hodel, Walter; and Weber, Heinz P., 5,151,911, Cl. 372-32.000.

Beaulardi, Leandro: *See*—
Contursi, Luigi; and Beaulardi, Leandro, 5,151,260, Cl. 423-412.000.

Beaulieu, Norman R.; Clark, David E.; Clingman, Arthur B., III; Jeffrey, Richard F.; Mahlum, James A.; and Reeves, Larry E., to J & L Industries, Inc. Carton folding apparatus. 5,151,075, Cl. 493-179.000.

Bec, Jean-Louis: *See*—
Samain, Daniel; Bec, Jean-Louis; Cohen, Edith; Nguyen, Frederique; and Peyrot, Marianne, 5,151,264, Cl. 424-1.100.

Bechler, Ronald F.: *See*—
Stegeman, Aaron H.; and Bechler, Ronald F., 5,150,762, Cl. 180-208.000.

Beck, Karin H.; Etzbach, Karl-Heinz; and Schmidt, Hans-Werner, to BASF Aktiengesellschaft. Polymerizable perylene-3,4,9,10-tetracarbimides. 5,151,516, Cl. 546-37.000.

Beckerman, Howard L., to Atlas Roll-Lite Door Corporation. Motor overload indicating arrangement. 5,151,638, Cl. 318-434.000.

Beckman Instruments, Inc.: *See*—
Conn, Thomas E.; and Kwan, Benson, 5,150,932, Cl. 292-202.000.

Strong, Kathleen M.; and Matusewicz, Richard S., 5,150,971, Cl. 383-84.000.

Beckmann, Robert J.: *See*—
Bang, Nils U.; Beckmann, Robert J.; Jaskunas, S. Richard; Lai, Mei-Huei T.; Little, Sheila P.; Long, George L.; and Santerre, Robert F., 5,151,268, Cl. 424-94.640.

Becton, Dickinson and Company: *See*—
Lambert, James M.; and Solomon, Donald D., 5,151,231, Cl. 264-108.000.

Beebe, James C.; Cargould, Barry D.; and Lees, David W., Sr., to Illinois Tool Works Inc. Apparatus and method for determining a center and measuring with reference thereto. 5,151,870, Cl. 364-556.000.

Beeson, Charles L.; Cole, Raymond T.; Deak, Gedeon I.; and Leidolf, Harbeson H., Jr., to Du Pont de Nemours, E. I., and Company. Solvent blockers and multilayer barrier coatings for thin films. 5,151,331, Cl. 428-475.500.

Begley, William J.; Chen, Teh-hsuan; Ling, Hans G.; Harder, John W.; and Bowne, Arlyce T., to Eastman Kodak Company. Photographic material and process comprising wash-out naphtholic coupler. 5,151,343, Cl. 430-382.000.

Behling, James R.; Farid, Payman; Khanna, Ish; Medich, John R.; Prunier, Mike; Scaros, Mike G.; and Weier, Richard M., to G. D. Searle & Co. Process for the preparation of 1,5-(alkylimino)-1,5-dideoxy-D-glucitol and derivatives thereof. 5,151,519, Cl. 546-219.000.

Behmann, Henry, to Zenon Environmental, Inc. Membrane bioreactor system with in-line gas micronizer. 5,151,187, Cl. 210-607.000.

Behrens, Paul W.: *See*—
Delente, Jacques J.; Behrens, Paul W.; and Hoeksema, Scot D., 5,151,347, Cl. 435-3.000.

Behun, Vaughn D.: *See*—
Holloway, Sidney E., III; Crossley, Edward A., Jr.; Jones, Irby W.; Miller, James B.; Davis, C. Calvin; Behun, Vaughn D.; and Goodrich, Lewis R., Sr., 5,150,875, Cl. 248-550.000.

Beigel, Gerhard: *See*—
Range, Helmut; and Beigel, Gerhard, 5,151,037, Cl. 439-110.000.
Range, Helmut; Beigel, Gerhard; Lotsch, Friedemann; and Debie, Peter, 5,151,038, Cl. 439-122.000.

Bein, Thomas; Brown, Kelly D.; Frye, Gregory C.; and Brinker, Charles J., to University of New Mexico. Molecular sieve sensors for selective detection at the nanogram level. 5,151,110, Cl. 55-75.000.

Bela, D. Arpad: *See*—
Perenyi, Andras; Utpal, Goswami; Arato, Mihaly; Frescka, Ede; Knoll, Jozsef; and Bela, D. Arpad, 5,151,419, Cl. 514-226.200.

Bell & Howell Company: *See*—
Ricciardi, Mario, 5,150,894, Cl. 271-302.000.
Svyatsky, Eduard M.; Paroubek, George; and Hegland, Frederick P., 5,150,891, Cl. 271-35.000.

Bell, Jack H.; Zak, Henry C.; and De Santis, Dominick A., to Belzak Corporation, The. Peroxygen compound activation. 5,151,212, Cl. 252-186.380.

Bell, Michael. Sliding anchor system and method of use. 5,150,766, Cl. 182-100.000.

Belleau, Bernard; and Nguyen-Ba, Nghe, to BioChem Pharma Inc. 2-substituted-5-substituted-1,3-oxathiolanes with antiviral properties. 5,151,426, Cl. 514-262.000.

Beloit Corporation: *See*—
Adams, Richard J., 5,150,850, Cl. 242-66.000.

Belzak Corporation, The: *See*—
Bell, Jack H.; Zak, Henry C.; and De Santis, Dominick A., 5,151,212, Cl. 252-186.380.

Bennett, Harold R.: *See*—
Emery, Kenneth R.; Bennett, Harold R.; and Clark, Jack, 5,151,561, Cl. 174-120.00R.

Bennett, Robert A., to Ambrogio, Charlotte; and Conant, Sally, a part interest. Sinker slider. 5,150,540, Cl. 43-43.120.

Bentivenga, Salvatore: *See*—
Blair, William D.; and Bentivenga, Salvatore, 5,151,670, Cl. 333-126.000.

Benveniste, Edgar R.; Tarlow, Kenneth A.; Goodman, Harold; and Benveniste, Gloria H., to Benveniste, Edgar R.; and Benveniste, Gloria. Videotape storage device. 5,150,953, Cl. 312-9.580.

Benveniste, Gloria: *See*—
Benveniste, Edgar R.; Tarlow, Kenneth A.; Goodman, Harold; and Benveniste, Gloria H., 5,150,953, Cl. 312-9.580.

Benveniste, Gloria H.: *See*—
Benveniste, Edgar R.; Tarlow, Kenneth A.; Goodman, Harold; and Benveniste, Gloria H., 5,150,953, Cl. 312-9.580.

Berfield, Robert C., to Shop Vac Corporation. Static electric discharge for dust collector. 5,150,499, Cl. 15-327.100.

Berg, Lloyd, to Berg, Lloyd. Dehydration of 2-methoxyethanol by extractive distillation. 5,151,160, Cl. 203-14.000.

Berger, Hubert: *See*—
Boquillon, Jean-Pierre; Berger, Hubert; and Bresson, Philippe, 5,151,134, Cl. 134-1.000.

Berger, Joachim: *See*—
Kull, Hermann; Berger, Joachim; Gerstung, Ulrich; and Bleuel, Klaus, 5,150,681, Cl. 123-399.000.

Berger, Richard. Method of and system for determining a position of ball relative to a playing field, and ball provided therefor. 5,150,895, Cl. 273-29.00R.

Berggren Oy Ab: *See*—
Österholm, Jan-Erik; Laakso, Jukka; Karjalainen, Sari; and Mononen, Pirjo, 5,151,221, Cl. 252-500.000.

Bergmann, Gerhard, to Karl Mayer Textilmaschinenfabrik. Warp knitting machine process and the pile ware produced thereby. 5,150,587, Cl. 66-195.000.

Bergmann, Gyorgy; Hivessy, Geza; Homola, Tamas; Bakay, Arpad; and Horvath, Mihaly, to Energiagazdalkodasi Intezet. Heat exchanger apparatus, particularly for hybrid heat pumps operated with non-azeotropic work fluids. 5,150,749, Cl. 165-115.000.

Bergmans, Johannes W. M., to U.S. Philips Corporation. Method and apparatus for assigning binary values to sample values of a waveform representing a pattern of recording marks on a record carrier. 5,151,891, Cl. 369-59.000.

Bergot, B. John: *See*—
Stec, Wojciech J.; Uznanski, Bogdan; Bergot, B. John; Hirschbein, Bernard L.; and Fearon, Karen L., 5,151,510, Cl. 536-27.000.

Berman, Robin E.: *See*—
Lundy, Douglas A.; Jugle, Kip L.; MacDonald, Daniel W.; Berman, Robin E.; and Hurwitch, Carl B., 5,151,744, Cl. 355-296.000.

Bernard, Jean; and Ruin, Jean. Crank-handle for a fishing reel. 5,150,853, Cl. 242-283.000.

Bernardon, Edward; and Foley, Michael F., to Charles Stark Draper Lab., Inc., The. Reconfigurable fiber-forming resin transfer system. 5,151,277, Cl. 425-112.000.

Bernhard, Herbert, to Seitz Enzinger Noll Maschinenbau Aktiengesellschaft. Closing mechanism for a capping machine. 5,150,558, Cl. 53-167.000.

Bernstein, Philip: *See*—
Kamen, Melvin E.; and Bernstein, Philip, 5,150,791, Cl. 206-457.000.

Berry, Haskell B., Jr.: *See*—
Miller, Charles R.; Berry, Haskell B., Jr.; and Johnson, Tod S., 5,150,843, Cl. 241-27.000.

Berry, Tommie, Jr.: *See*—
Farrall, George A.; Cocoma, John P.; Dakin, James T.; Duffy, Mark E.; and Berry, Tommie, Jr., 5,151,633, Cl. 315-248.000.

Bertin & Cie: *See*—
Boquet, Jean P. M.; Ermisse, Daniel J. A.; and Cattin, Gabriel J. L., 5,150,548, Cl. 51-313.000.

Bertram, James L.; Walker, Louis L.; McCrary, Avis L.; and Cortez, Fermin M., to Dow Chemical Company, The. Substituted phenol-formaldehyde novolac resins containing reduced quantities of 2-functional components and epoxy novolac resins prepared therefrom. 5,151,496, Cl. 528-500.000.

Bescoby, Frank A.: *See*—
Emerson, Terence P.; Bescoby, Frank A.; Taylor, Colin M.; and Payne, George K., 5,151,022, Cl. 423-245.300.

Bessler, Warren F.: *See*—
Jaster, Heinz; and Bessler, Warren F., 5,150,583, Cl. 62-179.000.

Besst Frozen Products, Inc.: *See*—
Curry, Ernest W.; and Beach, Marvin F., 5,151,288, Cl. 426-474.000.

Best, Robert J.; Larkin, Mark E.; and Zaha, Juergen H., to Abbott Laboratories. Syringe and needle guard assembly. 5,151,090, Cl. 604-192.000.

Bettini, Roberto: *See*—
Vercesi, Roberto; and Bettini, Roberto, 5,151,646, Cl. 322-28.000.

Beuscher, Norbert; and Scheit, Karl-Heinz, to Schaper & Bruemmer GmbH & Co. KG. Glycoprotein from *Avena sativa*, process for its preparation, and pharmaceutical compositions containing same. 5,151,498, Cl. 530-372.000.

Beverly Hills Fan Company: *See*—
Rezek, Ron, 5,151,011, Cl. 416-5.000.

Bevis, Gerald C.: *See*—
Crom, Theodore R.; and Bevis, Gerald C., 5,150,551, Cl. 52-223.00R.

Beyar, Rafael: *See*—
Halmann, Menachem; Azhari, Haim; Beyar, Rafael; Sideman, Samuel; and Dinnar, Uri, 5,151,856, Cl. 364-413.030.

Beyreuter, Konrad T.: *See*—
Salbaum, Johannes M. H.; Masters, Colin L.; and Beyreuter, Konrad T., 5,151,508, Cl. 536-27.000.

Bhaumik, Debabrata; and Chen, Patrick K., to Allergan, Inc. Method for tinting a hydrophilic polymer by incorporating a reactive dye into the polymer prior to polymerization. 5,151,106, Cl. 8-507.000.

Bi, Junging; Beaud, Paul A.; Schutz, Jurg A.; Hodel, Walter; and Weber, Heinz P., to Weber, Heinz P. Process for reducing high-frequency energy noise components in the output radiation of a laser, process for generating short laser pulses, and lasers utilized for this purpose. 5,151,911, Cl. 372-32.000.

Biasone, Frank: *See*—
Durkin, Thomas B.; and Biasone, Frank, 5,151,316, Cl. 428-213.000.

Bicc plc: *See*—
Downie, Ian, 5,151,143, Cl. 156-48.000.

Bich, Gary L.; and Hall, Larry D., to Ford New Holland, Inc. Apparatus for converting gathering chain profiles in forage harvester row crop attachments. 5,150,564, Cl. 56-98.000.

Bich, Gary L., to Ford New Holland, Inc. Knife mounting arrangement for forage harvester row crop attachments. 5,150,565, Cl. 56-102.000.

Bick, Claus. Method and apparatus for inducing and establishing a changed state of consciousness. 5,151,080, Cl. 600-28.000.

Bickel, Hans, to Renfe. Entering and exiting step system for vehicles with two step pivotal support for accommodating platforms of varying heights. 5,150,659, Cl. 105-447.000.

Bickley, Robert H., to Motorola, Inc. High resolution frequency synthesis. 5,152,005, Cl. 455-76.000.

Biehl, Wilfried; and Kleine-Onnibrink, Bernhard, to Siemens Aktiengesellschaft. Electromagnetic relay with a contact spring mounted on an armature. 5,151,675, Cl. 335-78.000.

Bilco Tools, Inc.: *See*—
Penisson, Dennis J., 5,150,638, Cl. 81-57.170.

Bio-Technology General Corp.: *See*—
Levanon, Avigdor; Oppenheim, Amos B.; and Locker-Giladi, Hilla, 5,151,364, Cl. 435-252.330.

BioChem Pharma Inc.: *See*—
Belleau, Bernard; and Nguyen-Ba, Nghe, 5,151,426, Cl. 514-262.000.

Biomedical Devices Company: *See*—
Ferkany, Michael A., 5,151,184, Cl. 210-514.000.

Biomembrane Institute: *See*—
Handa, Kazuko; Igarashi, Yasuyuki; Ahmad, Mahammad N.; and Hakomori, Sen-Itiroh, 5,151,360, Cl. 435-240.200.

Birang, Manoocher: *See*—
Ebbing, Peter; and Birang, Manoocher, 5,151,584, Cl. 250-201.400.

Bird, Charles R.: *See*—
Momont, Timothy W.; and Bird, Charles R., 5,150,666, Cl. 119-57.910.

Bird, Gerald C.; and Hansen, Paul E., to Minnesota Mining and Manufacturing Company. Component carrier tape. 5,150,787, Cl. 206-329.000.

Bisbing, Robert H., to Southco, Inc. Adjustable lift-off hinge. 5,150,500, Cl. 16-239.000.

Bittner, Steven P.: *See*—
Brevick, John E.; Bittner, Steven P.; and Kling, Briant J., 5,150,676, Cl. 123-195.00R.

Biuso, Tony: *See*—
Metlitsky, Boris; Swartz, Jerome; Barkan, Edward; Shepard, Howard; Goren, David; and Biuso, Tony, 5,151,580, Cl. 235-462.000.

Bizen, Yoshio: *See*—
Yoshizawa, Yoshihito; Bizen, Yoshio; Yamauchi, Kiyotaka; Nishiyama, Toshikazu; and Suwabe, Shigekazu, 5,151,137, Cl. 148-313.000.

Black, Michael, to Reliant Laser Corporation. Noseshade for monitoring exposure to ultraviolet radiation. 5,151,600, Cl. 250-372.000.

Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, to McDonnell Douglas Corporation. Advanced survivable radiator. 5,150,748, Cl. 165-41.000.

Blackwell, Daniel C.; and Koskol, Joseph E., to Du Pont de Nemours, E. I., and Company. Weft feeding through an accumulator without substantial twist. 5,150,739, Cl. 139-452.000.

Blair, David L.: *See*—
Boenning, Robert A.; and Blair, David L., 5,150,603, Cl. 73-31.050.

Blair, William D.; and Bentivenga, Salvatore, to Radio Frequency Systems, Inc. Duplexing filter. 5,151,670, Cl. 333-126.000.

Blanc, Pierre-Alain: *See*—
Giersch, Wolfgang K.; Blanc, Pierre-Alain; and Schulte-Elte, Karl-Heinrich, 5,151,410, Cl. 512-9.000.

Blanchard and Co.: *See*—
Blanchard, William C.; and Lee, Cheng S., 5,151,164, Cl. 204-182.100.

Blanchard, William C.; and Lee, Cheng S., to University of Maryland, The; and Blanchard and Co. Enhanced capillary zone electrophoresis and apparatus for performance thereof. 5,151,164, Cl. 204-182.100.

Blanchet, Oscar; and Mills, Donald. Rotationally resistive pail, pail support and coupling for cementatious or viscous materials. 5,150,804, Cl. 220-212.000.

Blanding, Douglass L.; Harrigan, Michael E.; and Kessler, David, to Eastman Kodak Company. Method for alignment of scan line optics with target medium. 5,151,810, Cl. 359-198.000.

Bleich, Herman E.; Franco, Luis P.; and Sanders, Ian L., to International Business Machines Corporation. Method for forming a protective film on a slider air bearing surface in a magnetic recording disk file. 5,151,294, Cl. 427-11.000.

Blessing, Andreas; Griss, Jochen; and Kammerer, Gerd, to Grasslin KG. Method and apparatus for determining the energy content value of electrochemical energy stores. 5,151,865, Cl. 364-483.000.

Bleuel, Klaus: *See*—
Kull, Hermann; Berger, Joachim; Gerstung, Ulrich; and Bleuel, Klaus, 5,150,681, Cl. 123-399.000.

Bloemer, Mark J., to United States of America, Army. Waveguide polarizer using localized surface plasmons. 5,151,956, Cl. 385-11.000.

Blom, Niels J., to Haldor Topsoe A/S. Modified crystalline aluminosilicate and method of preparing the same. 5,151,259, Cl. 423-328.000.

Bloom, Arnold: *See*—
Perilloux, Bruce; Bloom, Arnold; Fischer, Dennis; Giammona, Larry; and Johnston, Thomas F., 5,151,917, Cl. 372-102.000.

Bloom, Jonathan D.; Claus, Thomas H.; DeVries, Vern G.; Dolan, Jo A.; and Dutia, Minu D., to American Cyanamid Company. Substituted 5-(2-((2-aryl-2-hydroxyethyl)amino)propyi)-1,3-benzodioxoles. 5,151,439, Cl. 514-376.000.

Blum, Dieter W. Method and apparatus for identifying and eliminating specific material from video signals. 5,151,788, Cl. 358-188.000.

Boadway, John D.: *See*—
Flanigan, David A.; and Boadway, John D., 5,151,079, Cl. 494-27.000.

Boatwright, Gregory L.: *See*—
Foster, Walter W.; Boatwright, Gregory L.; and Lewis, Thomas E., 5,151,147, Cl. 156-244.120.

Boaz, John M. D. Bird power feeder. 5,150,665, Cl. 119-52.300.

BOC Group, Inc., The: *See*—
Alcala, J. Ricardo, 5,151,869, Cl. 364-497.000.

BOC Group plc, The: *See*—
Clements, Stephen; and King, Brian, 5,151,119, Cl. 65-84.000.

Bock, Allyn P., to Caterpillar, Inc. Cylinder liner with coolant sleeve. 5,150,668, Cl. 123-41.800.

Bodenseewerk Geratetechnik GmbH: *See*—
Hingst, Uwe, 5,150,579, Cl. 62-51.200.

Boeing Aerospace and Electronics: *See*—
Badger, Scott L.; Braun, John P.; and Goodman, Sperry H., 5,151,705, Cl. 342-368.000.

Boeing Company, The: *See*—
Lubowitz, Hyman R.; and Sheppard, Clyde H., 5,151,487, Cl. 528-170.000.
Merkel, Edwin W.; and Koontz, Stephen W., 5,150,861, Cl. 244-91.000.
Woods, Mark A., 5,150,623, Cl. 73-865.800.
Young, Manley A., 5,150,860, Cl. 244-63.000.

Boella, Marcello: *See*—
Nepote, Andrea; and Boella, Marcello, 5,151,634, Cl. 315-307.000.

Boenning, Robert A.; and Blair, David L., to Westinghouse Electric Corp. Hydrocarbon vapor sensor and system. 5,150,603, Cl. 73-31.050.

Boeri, John L. Hollow, non-nestable packing peanuts of recycled newspaper. 5,151,312, Cl. 428-156.000.

Boero, Paolo; and Bortolin, Bruno, to Societa' Cavi Pirelli S.p.A. Process for making detachable connecting means for ribbon optical fiber cables and the connecting means obtained thereby. 5,150,516, Cl. 29-877.000.

Bogenhagen, David R., to Andersen Corporation. Corner lock. 5,150,983, Cl. 403-402.000.

Boissevain, Mathew G. Compound bow. 5,150,699, Cl. 124-25.600.

Bol, Igor I., to Xerox Corporation. Manufacture of a suspended micromechanical element. 5,151,153, Cl. 156-657.000.

Bommart, Patrick, to Delachaux S.A. Aluminothermic welding device crucible and crucible cover for use therewith. 5,151,202, Cl. 249-86.000.

Boniort, Jean-Yves: *See*—
Brehm, Claude; Boniort, Jean-Yves; Tardy, Andre ; and Com-Nougue, Jacques, 5,151,966, Cl. 385-128.000.

Boone, Thomas C.: *See*—
Souza, Lawrence M.; and Boone, Thomas C., 5,151,511, Cl. 536-27.000.

Booth, Dwight E., to Dana Corporation. Armature assembly for an electromagnetic coupling. 5,150,779, Cl. 192-106.100.

Boquet, Jean P. M.; Ermisse, Daniel J. A.; and Cattin, Gabriel J. L., to Bertin & Cie; and Cattin'Air SA. Method for treating the surface of an article with solid particles. 5,150,548, Cl. 51-313.000.

Boquillon, Jean-Pierre; Berger, Hubert; and Bresson, Philippe, to Agence Regionale de Developpements Technologiques. Method and a device for cleaning a surface with a laser. 5,151,134, Cl. 134-1.000.

Borchard, John S. Capacitor-sensor. 5,150,759, Cl. 177-210.00C.

Bormann, Thomas: *See*—
Matkovich, Vlado I.; Degen, Peter J.; Gsell, Thomas C.; Bormann, Thomas; and Rothman, Isaac, 5,151,192, Cl. 210-646.000.

Bortolin, Bruno: *See*—
Boero, Paolo; and Bortolin, Bruno, 5,150,516, Cl. 29-877.000.

Boston Scientific Corporation: *See*—
Abele, John E.; Lennox, Charles E.; Nardella, Paul C.; and Joshi, Sharad H., 5,151,100, Cl. 606-28.000.

Boston University: *See*—
Coan, Thomas E.; and Ahlen, Steven P., 5,151,963, Cl. 385-88.000.

Bothe, Lothar, to Hoechst Aktiengesellschaft. Biaxially-oriented polyolefin multi-layer film which can be sealed on both sides, and the preparation and use of the same. 5,151,317, Cl. 428-216.000.

Bottari, Frank J.; Hanoka, Jack; and Sylva, Frank W., to Mobil Solar Energy Corporation. Method of applying metallized contacts to a solar cell. 5,151,386, Cl. 437-187.000.

Bottei, Louis A.: *See*—
Bracuti, Arthur J.; and Bottei, Louis A., 5,151,557, Cl. 102-435.000.

Bourgeot, Jacques, to Caoutchouc Manufacture et Plastiques S.A. Train of railway cars having truncated conical resilient articulation on shared truck between two adjacent cars. 5,150,657, Cl. 105-3.000.

Bourke, Michael J. Newspaper delivery box. 5,150,834, Cl. 232-1.00C.

Boutet, John C.; and Brandt, Michael B., to Eastman Kodak Company. Flare minimization in split V-roof mirror collector. 5,151,592, Cl. 250-228.000.

Boutros, Kamal S.: *See*—
Briones, Francisco R.; and Boutros, Kamal S., 5,151,054, Cl. 439-620.000.

Bowen, Colin P.; and Brewer, John R., to Stone & Webster Engineering Corporation. Thermal cracking furnace. 5,151,158, Cl. 196-110.000.

Bowers-Irons, Gail A.: *See*—
Brimhall, Owen D.; Bowers-Irons, Gail A.; and Weeks, Joseph K., Jr., 5,151,368, Cl. 435-312.000.

Bowman, Donald J.; Crane, Jerry D.; Edwards, Scott G.; Edwards, Kathryn M.; and Englund, Sven R. Modular digital telephone system with fully distributed local switching and control. 5,151,896, Cl. 370-85.130.

Bowman, Harold M.; and Fuller, George T., to Bowman, Harold M. Stiffening flanges for deformation resistance of manhole cover support. 5,150,984, Cl. 404-26.000.

Bowne, Arlyce T.: *See*—
Begley, William J.; Chen, Teh-hsuan; Ling, Hans G.; Harder, John W.; and Bowne, Arlyce T., 5,151,343, Cl. 430-382.000.

Boy, Jurgen; and Jacubeit, Matthias, to Siemens Aktiengesellschaft. Triggerable switching spark gap. 5,151,630, Cl. 313-602.000.

Boyd, James A.; and Melanson, Dan. Snowmobile flotation system. 5,150,662, Cl. 114-68.000.

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Hergenrother, William L.; and Doshak, John M., 5,151,469, Cl. 525-354.000.
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Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, 5,150,924, Cl. 285-101.000.
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Sato, Shougo; Ohashi, Tsuyoshi; and Hirahata, Shinichi, 5,151,586, Cl. 250-205.000.

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Hubbard, Vance M.; and Brunson, Welton K., 5,150,703, Cl. 128-206.120.

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Bandy, Michael J.; Byerly, Roy H.; and Spoonmore, Robert T., 5,150,735, Cl. 137-614.060.

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Haubennestel, Karl-Heinz; and Pritschins, Wolfgang, 5,151,218, Cl. 252-351.000.

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Clerc, Daniel, 5,150,737, Cl. 137-625.300.

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Arahara, Kohzoh; Yuasa, Toshiya; Kai, Takashi; Tohyama, Noboru; Mouri, Akihiro; and Matsumoto, Kenichi, 5,151,712, Cl. 346-1.100.
Ebinuma, Ryuichi, 5,151,967, Cl. 385-138.000.
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Iwashita, Tomonori; Egawa, Akira; and Sugiyama, Yoshiaki, 5,151,726, Cl. 354-75.000.
Kanemitsu, Shinji, 5,151,716, Cl. 346-140.00R.
Makino, Jun, 5,151,811, Cl. 359-198.000.
Masuda, Shunichi, 5,151,573, Cl. 219-216.000.
Masuda, Yoshitaka, 5,151,593, Cl. 250-234.000.
Matsumoto, Shigeyuki; and Ikeda, Osamu, 5,151,305, Cl. 427-252.000.
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Ohzeki, Yukihiro; Araya, Junji; Ishiyama, Tatsunori; Sato, Yasushi; and Nakahata, Kimio, 5,151,736, Cl. 355-208.000.
Sakamoto, Masahiro; and Kataoka, Junnosuke, 5,151,640, Cl. 318-696.000.
Shikichi, Satoshi; and Nakahara, Takashi, 5,151,888, Cl. 369-44.320.
Takeuchi, Tatsuo; and Amemiya, Koji, 5,151,313, Cl. 428-192.000.
Tokunaga, Hiroyuki, 5,151,296, Cl. 427-38.000.
Tokunaga, Tatsuyuki; Aoyama, Keisuke; Fukahori, Hidehiko; Suda, Yasuo; and Akashi, Akira, 5,151,583, Cl. 250-201.200.
Tsuda, Tadayuki; Watanabe, Kazushi; Ikemoto, Isao; and Sasaki, Shinichi, 5,151,734, Cl. 355-200.000.
Yakou, Takeshi, 5,150,937, Cl. 294-119.100.
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Bourgeot, Jacques, 5,150,657, Cl. 105-3.000.

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McCardell, Willard B., 5,151,052, Cl. 439-598.000.

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Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; and Colin, Michel, 5,151,534, Cl. 554-88.000.

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Centrix, Inc.: *See*—
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CFR Corporation: *See*—
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Chaki, Haruyuki: *See*—
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Chang, Chi K.: *See*—
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Chase, Robert F.: *See—*
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Chauvel, Jean P., Jr.: *See—*
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Chen, Chin-Lung. Anchor pile and concrete protection wall construction using said anchor pile. 5,150,549, Cl. 52-162.000.
Chen, Chungte W., to Hughes Aircraft Company. Biocular eyepiece optical system employing refractive and diffractive optical elements. 5,151,823, Cl. 359-565.000.
Chen, Linda: *See—*
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Chen, Patrick K.: *See—*
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Chiang, Long Y.; and Lai, Wen-Yih F., to Exxon Research and Engineering Company. Highly conducting organic polymer thin film coatings. 5,151,478, Cl. 526-258.000.
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Chmiel, Horst: *See—*
Grobe, Anneliese; and Chmiel, Horst, 5,151,193, Cl. 210-651.000.
Cho, Hyun S.; Sung, Chien-Min; Merrill, Leo; and Chen, Sy-Hwa, to Norton Company. Cemented and cemented/sintered superabrasive polycrystalline bodies and methods of manufacture thereof. 5,151,107, Cl. 51-295.000.
Choate, Gary E.: *See—*
Olson, Wayne L.; and Choate, Gary E., 5,150,768, Cl. 182-234.000.
Choji, Shinichiro: *See—*
Matsuno, Yoshio; Choji, Shinichiro; Ito, Kazuhiko; and Shigeta, Teruaki, 5,151,850, Cl. 362-75.000.
Chowdry, Arun: *See—*
Jamzadeh, Fereidoon S.; Chowdry, Arun; and Johnson, Kevin M., 5,151,717, Cl. 346-157.000.
Christensen, Kenneth L.: *See—*
Ward, Jefferson P.; Harmon, J. P.; English, Kris M.; and Christensen, Kenneth L., 5,151,715, Cl. 346-140.00R.
Chrysler Corporation: *See—*
Depa, Henry F.; and Kopera, John J. C., 5,150,683, Cl. 123-417.000.
Frantz, Douglas C., 5,151,647, Cl. 322-99.000.
Chujo, Kaoru; Kakuishi, Mitsuo; and Fukui, Hirokazu, to Fujitsu Limited. Adaptive echo canceller. 5,151,937, Cl. 379-410.000.
Ciba-Geigy Corporation: *See—*
Babiarz, Joseph E.; and Rutsch, Werner, 5,151,459, Cl. 524-255.000.
Hari, Stefan; and Cseh, Georg, 5,151,505, Cl. 534-728.000.
Molleyres, Louis-Pierre, 5,151,427, Cl. 514-269.000.
Morrison, Donald J.; McGregor, David; and McCrae, James M., 5,151,129, Cl. 106-623.000.
Strasilla, Dieter; Stossel, Richard; Mulhaupt, Rolf; and Kreibich, Ursula, 5,151,318, Cl. 428-246.000.
Cippelletti, Ennio: *See—*
Giust, Henri; and Cippelletti, Ennio, 5,150,846, Cl. 242-54.00R.
Circon Corporation: *See—*
Grossi, Benedetto; and Muller, Richard P., 5,151,101, Cl. 606-46.000.
Cisar, Alan J., to Dow Chemical Company, The. Oxygen reduction catalyst based upon metal dipyridylamines. 5,151,515, Cl. 546-12.000.
Citizen Watch Co., Ltd.: *See—*
Wakasugi, Makoto; and Kasai, Takao, 5,151,837, Cl. 360-103.000.
Citta, Richard W., to Zenith Electronics Corporation. HDTV transmission system with reduced susceptibility to NTSC cochannel interference. 5,151,785, Cl. 358-141.000.
Clanton, J. Dwight: *See—*
Cole, William R., Jr.; Sanborn, Charles H., III; and Clanton, J. Dwight, 5,151,077, Cl. 493-353.000.
Clarion Co., Ltd.: *See—*
Hashimoto, Takeshi, 5,151,921, Cl. 375-1.000.
Clark, David E.: *See—*
Beaulleu, Norman R.; Clark, David E.; Clingman, Arthur B., III; Jeffrey, Richard F.; Mahlum, James A.; and Reeves, Larry E., 5,151,075, Cl. 493-179.000.
Clark, Frederick T.: *See—*
Kukes, Simon G.; Clark, Frederick T.; Hopkins, P. Donald; and Green, Lisa M., 5,151,172, Cl. 208-144.000.
Clark, Jack: *See—*
Emery, Kenneth R.; Bennett, Harold R.; and Clark, Jack, 5,151,561, Cl. 174-120.00R.
Clark, LeaLand L. Method of and composition for treating inflammation and the immunological response thereto. 5,151,425, Cl. 514-261.000.
Class OHG: *See—*
Damman, Martin; and Theissing, Gerhard, 5,151,064, Cl. 460-23.000.
Claus, Thomas H.: *See—*
Bloom, Jonathan D.; Claus, Thomas H.; DeVries, Vern G.; Dolan, Jo A.; and Dutia, Minu D., 5,151,439, Cl. 514-376.000.
Clear, Sandra H.: *See—*
Buell, Kenneth B.; Clear, Sandra H.; and Falcone, Danielia T., 5,151,092, Cl. 604-385.200.
Clements, Stephen; and King, Brian, to BOC Group plc, The. Cooling of molded articles with a mixture of evaporated cryogen and dried air. 5,151,119, Cl. 65-84.000.
Clendenin, Harry B.; and Fogt, James F., to Copeland Corporation. Sound attenuation chamber. 5,151,018, Cl. 417-312.000.
Clerc, Daniel, to C.I.C.E. S.A. Ceramic discs for taps and taps equipped with such discs. 5,150,737, Cl. 137-625.300.
Clingman, Arthur B., III: *See—*
Beaulleu, Norman R.; Clark, David E.; Clingman, Arthur B., III; Jeffrey, Richard F.; Mahlum, James A.; and Reeves, Larry E., 5,151,075, Cl. 493-179.000.
Coal Technology Corporation: *See—*
Wolfe, Richard A.; Im, Chang J.; and Wright, Robert E., 5,151,159, Cl. 202-118.000.
Coan, Thomas E.; and Ahlen, Steven P., to Boston University. Apparatus for coupling an optical transducer to a light guide. 5,151,963, Cl. 385-88.000.
Cockerham, Jefre H.; and Thayer, Edward B., to United Technologies Corporation. In-flight reverser. 5,150,862, Cl. 244-110.00B.
Cocoma, John P.: *See—*
Farrall, George A.; Cocoma, John P.; Dakin, James T.; Duffy, Mark E.; and Berry, Tommie, Jr., 5,151,633, Cl. 315-248.000.
Codinha, J. Albert. Military conflict board game. 5,150,908, Cl. 273-262.000.
Cody, Charles A.; and Magauran, Edward D., to Rheox, Inc. Process for deinking wastepaper with organically modified smectite clay. 5,151,155, Cl. 162-5.000.
Cohen, Carl M., to Sassy, Inc. Universal tether apparatus. 5,150,504, Cl. 24-302.000.
Cohen, Edith: *See—*
Samain, Daniel; Bec, Jean-Louis; Cohen, Edith; Nguyen, Frederique; and Peyrot, Marianne, 5,151,264, Cl. 424-1.100.
Coherent, Inc.: *See—*
Perilloux, Bruce; Bloom, Arnold; Fischer, Dennis; Giammona, Larry; and Johnston, Thomas F., 5,151,917, Cl. 372-102.000.
Colbert, Donald A.; and Anilionis, Algis, to Repligen Corporation. Cloned genes encoding recombinant protein A. 5,151,350, Cl. 435-69.100.
Cole, Raymond T.: *See—*
Beeson, Charles L.; Cole, Raymond T.; Deak, Gedeon I.; and Leidolf, Harbeson H., Jr., 5,151,331, Cl. 428-475.500.
Cole, William R., Jr.; Sanborn, Charles H., III; and Clanton, J. Dwight, to ARK, Inc. Method and apparatus for perforating material. 5,151,077, Cl. 493-353.000.
Colgate-Palmolive Company: *See—*
Maaser, Heidrun E., 5,151,223, Cl. 252-547.000.
Colin, Michel: *See—*
Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; and Colin, Michel, 5,151,534, Cl. 554-88.000.
Colket, Meredith B., III: *See—*
Spadaccini, Louis J.; Marteney, Pierre J.; and Colket, Meredith B., III, 5,151,171, Cl. 208-48.00Q.
Colli, Luigi; and Badiali, Roberto, to Savio S.p.A. Device and method for automatically connecting the yarn to the tube of a winding machine. 5,150,845, Cl. 242-35.50A.
Collingwood, David, to Renishaw plc. Signal transmission system for machine tools, inspection machines, and the like. 5,150,529, Cl. 33-503.000.
Collins, Wendell, Jr.: *See—*
Hamberg, James P.; Baldini, Todd H.; Smith, Stanley E.; Collins, Wendell, Jr.; and Longhouse, Richard E., 5,150,886, Cl. 267-220.000.

Com-Nougue, Jacques: *See—*
Brehm, Claude; Boniort, Jean-Yves; Tardy, Andre ; and Com-Nougue, Jacques, 5,151,966, Cl. 385-128.000.
Comasat: *See—*
Smith, Thane, 5,151,758, Cl. 357-22.000.
Combined Optical Industries Limited: *See—*
Pasco, Ian K., 5,151,826, Cl. 359-742.000.
Comeaux, Robert I. Dental filler applicator. 5,151,030, Cl. 433-118.000.
Commins, Alfred D.; and Romeo, Ernest A., to Simpson Strong-Tie Company, Inc. Holdown strap. 5,150,553, Cl. 52-264.000.
Commissariat a l'Energie Atomique: *See—*
Monnet, Olivier; and Vacher, Jacques, 5,151,599, Cl. 250-363.030.
Compagnie de Raffinage et de Distribution Total France: *See—*
Szabo, Georges; Schasfoort, Egbertus F. P.; and Milan, Alain, 5,151,400, Cl. 502-203.000.
Conant, Sally: *See—*
Bennett, Robert A., 5,150,540, Cl. 43-43.120.
Concept Analysis Corp.: *See—*
Glance, Patrick M.; and Glance, Paul, 5,150,935, Cl. 293-136.000.
Concept Design: *See—*
Farrow, Robert I.; and Johnson, Drey, 5,150,847, Cl. 242-56.00R.
Farrow, Robert I.; DeMint, Paul; Johnson, Drey; Gaude, Robert; and McNeill, Ray O., 5,150,849, Cl. 242-56.00R.
Cone, Dennis E.; and Gibson, James H. Free weight barbell spotting and racking machine. 5,151,072, Cl. 482-104.000.
Conley, Paul. Eyeglass case and retainer. 5,151,778, Cl. 351-156.000.
Conn, Thomas E.; and Kwan, Benson, to Beckman Instruments, Inc. Centrifuge lid safety lock. 5,150,932, Cl. 292-202.000.
Conoco Inc.: *See—*
White, Charles N.; and Goldsmith, Riley G., 5,150,987, Cl. 405-224.000.
Conoco Specialty Products Inc.: *See—*
Flanigan, David A.; and Boadway, John D., 5,151,079, Cl. 494-27.000.
Conrad, Richard H. Automatic purge method for ozone generators. 5,151,250, Cl. 422-2.000.
Conrow, Raymond E.: *See—*
DuPriest, Mark T.; Conrow, Raymond E.; and Kuzmich, Daniel, 5,151,544, Cl. 560-10.000.
Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., to International Business Machines Corporation. Planarized thin film surface covered wire bonded semiconductor package. 5,151,559, Cl. 174-52.400.
Consani, Alberto, to Alberto Consani S.p.A. Re-reeling machine working at constant speed and related cutting device. 5,150,848, Cl. 242-56.00R.
Consiglie Nazionale delle Ricerche: *See—*
Flamini, Alberto; and Poli, Nicola, 5,151,527, Cl. 548-451.000.
Contraves Italiana S.p.A.: *See—*
Secci, Giovanni, 5,150,770, Cl. 185-40.00R.
Contursi, Luigi; and Beaulardi, Leandro, to Temay S.p.A. Process for preparing fine powders of aluminum nitride. 5,151,260, Cl. 423-412.000.
Cook, David C.; Hart, Terance W.; Mc Lay, Iain M.; Palfreyman, Malcolm N.; Sharp, Brian W.; and Walsh, Roger J. A., to Rhone-Poulenc Sante. Derivatives of thioformamide. 5,151,436, Cl. 514-314.000.
Cook-Martin, David M., to Unilab Holdings, Ltd. Fluid mechanics devices. 5,150,883, Cl. 251-367.000.
Cooper Industries, Inc.: *See—*
Urban, Paul L., 5,151,574, Cl. 219-241.000.
Cooper, Stephen R. W.: *See—*
Rymut, Michael J.; Cooper, Stephen R. W.; and Washeleski, John M., 5,150,615, Cl. 73-313.000.
Copeland Corporation: *See—*
Clendenin, Harry B.; and Fogt, James F., 5,151,018, Cl. 417-312.000.
Coquet, Pascal D.: *See—*
Valy, Yves H. G.; Coquet, Pascal D.; and Amagat, Michel, 5,150,741, Cl. 141-18.000.
Corning Incorporated: *See—*
Allendorf, Stephan C.; and Dair, Thomas M., 5,151,721, Cl. 351-121.000.
Bartholomew, Roger F.; and Sadd, Andrea L., 5,151,117, Cl. 65-3.120.
Cortez, Fermin M.: *See—*
Bertram, James L.; Walker, Louis L.; McCrary, Avis L.; and Cortez, Fermin M., 5,151,496, Cl. 528-500.000.
Cothran, Philip E.: *See—*
McCall, Patrick C.; and Cothran, Philip E., 5,151,209, Cl. 252-174.150.
Cottrell, Paul R.: *See—*
Fettis, Michael E.; and Cottrell, Paul R., 5,151,392, Cl. 502-37.000.
Coutant, Herve G. F.: *See—*
Azzara, Sauveur A.; and Coutant, Herve G. F., 5,151,236, Cl. 264-257.000.
Couturier, Alain, to Thomson-CSF. Device for forming images on a large surface and simulator equipped with such a device. 5,151,802, Cl. 359-51.000.
Cox, James L.; and Jaquiss, Robert D. B. Cooling net for cardiac or transplant surgery. 5,150,706, Cl. 128-400.000.
Cox, Johnny R.: *See—*
Moore, Jack S., Jr.; Cox, Johnny R.; and Williams, Mark L., 5,150,621, Cl. 73-863.910.
Cramer, Wilfried: *See—*
Podszun, Wolfgang; Muller, Michael; Cramer, Wilfried; and Rehbold, Bodo, 5,151,480, Cl. 526-279.000.
Crane, Jerry D.: *See—*
Bowman, Donald J.; Crane, Jerry D.; Edwards, Scott G.; Edwards, Kathryn M.; and Englund, Sven R., 5,151,896, Cl. 370-85.130.
Crane, Timothy T.; Menelly, Richard A.; and Danek, Robert J. Currency verification device including ferrous oxide detection. 5,151,607, Cl. 250-556.000.
Cravens, David M.; Denlinger, Keith R.; Gryzbowski, Richard W.; and Myer, John M., to AMP Incorporated. Seals for an electrical connector. 5,151,045, Cl. 439-271.000.
Craw, Marjory T.; McCrimmon, Kevin D.; and Deschenes, Lyse L., to Atomic Energy of Canada Limited. Silylation of charcoal to increase its hydrophobicity. 5,151,402, Cl. 502-401.000.
Cray Research, Inc.: *See—*
Garcia, Susan J., 5,151,995, Cl. 395-800.000.
Crenshaw, Roger T.; and Wiesner, Mark G. Method for treating premature ejaculation. 5,151,448, Cl. 514-651.000.
Croft, Alan P.; and Koblinski, Brian D., to Dow Chemical Company, The. Amine-based consistency reducers for gypsum stucco slurries. 5,151,130, Cl. 106-778.000.
Crom Corporation, The: *See—*
Crom, Theodore R.; and Bevis, Gerald C., 5,150,551, Cl. 52-223.00R.
Crom, Theodore R.; and Bevis, Gerald C., to Crom Corporation, The. Prestressed composite concrete tank with improved pump joint and method for constructing the same. 5,150,551, Cl. 52-223.00R.
Crosfield Electronics Limited: *See—*
Freeman, Stephen, 5,151,686, Cl. 340-703.000.
Croshaw, Steven P., to Saddleman, Inc. Dual-tongue seat cover attachment. 5,150,947, Cl. 297-229.000.
Crossley, Edward A., Jr.: *See—*
Holloway, Sidney E., III; Crossley, Edward A., Jr.; Jones, Irby W.; Miller, James B.; Davis, C. Calvin; Behun, Vaughn D.; and Goodrich, Lewis R., Sr., 5,150,875, Cl. 248-550.000.
Crowley, Carmel; Sheehan, Timothy G.; and Ward, Frederick G., to Warner Lambert Pottery Road Limited. Process for the production of high purity thrombin. 5,151,355, Cl. 435-214.000.
Crowley, H. W., to Roll Systems, Inc. System and method for manufacturing envelopes. 5,150,560, Cl. 53-411.000.
Crown Cork & Seal Company, Inc.: *See—*
Yun, Chung J., 5,150,740, Cl. 141-6.000.
Croze, Edward M., to E. R. Squibb & Sons, Inc. Method for purification of monoclonal antibodies. 5,151,504, Cl. 530-413.000.
CS Halbleiter- und Solartechnologie GmbH: *See—*
Scholz, Christoph; and Sefalidis, Yassilios, 5,151,116, Cl. 55-387.000.
Cseh, Georg: *See—*
Hari, Stefan; and Cseh, Georg, 5,151,505, Cl. 534-728.000.
CTB, Inc.: *See—*
Momont, Timothy W.; and Bird, Charles R., 5,150,666, Cl. 119-57.910.
Culpon, Douglas H., Jr., to Texaco Inc. Chain and drive gear lubricant. 5,151,205, Cl. 252-56.00R.
Culross, Claude C.: *See—*
Vaughn, Stephen N.; Siskin, Michael; Katritzky, Alan; Brons, Glen; Reynolds, Steve N.; Culross, Claude C.; and Neskora, Dan R., 5,151,173, Cl. 208-430.000.
Culver, David S.: *See—*
Brady, James; Chan, Tsiu C.; and Culver, David S., 5,151,387, Cl. 437-191.000.
Cummins Engine Company, Inc.: *See—*
Johnson, Kenneth L.; and Updike, William A., 5,150,572, Cl. 60-272.000.
Cunningham, Linda J.; Adams, Brian; and Barham, William, to Gallaher Ltd. Filter tipped smoking rods. 5,150,725, Cl. 131-365.000.
Cuno, Incorporated: *See—*
Giordano, Edward C.; O'Brien, Mark; Petrucci, Raymond M.; and Taylor, Bruce G., 5,151,180, Cl. 210-264.000.
Currie, James H.; Peden, Richard A.; Sczomak, David P.; Mitchell, Mark A.; and Brown, Michael J., to General Motors Corporation. Diesel engine closed loop air/fuel ratio control. 5,150,694, Cl. 123-569.000.
Curry, Ernest W.; and Beach, Marvin F., to Besst Frozen Products, Inc. Food processing apparatus and method. 5,151,288, Cl. 426-474.000.
Curtis, Tony G.: *See—*
Powers, Kelly R.; Curtis, Tony G.; Limaye, Santosh Y.; and Roy, Robert D., 5,151,660, Cl. 324-689.000.
CVD Incorporated: *See—*
Goela, Jitendra S.; Pickering, Michael; and Taylor, Raymond L., 5,150,507, Cl. 29-460.000.
D.E.M. Controls of Canada: *See—*
D'Amato, Mark, 5,150,727, Cl. 134-104.200.
Daiichi Seiki Kaisha Kabushiki Kaisha: *See—*
Murakami, Koichi; Matsuo, Kazuhiro; Iizumi, Kenichi; and Tagawa, Yoichi, 5,150,998, Cl. 412-14.000.
Daikin Industries, Ltd.: *See—*
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 5,151,206, Cl. 252-62.510.
Daikuzono, Norio, to S.L.T. Japan Co., Ltd. Laser light emitter. 5,151,097, Cl. 606-15.000.

Daimon, Shiego: *See*—
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 5,151,206, Cl. 252-62.510.

Dainippon Ink and Chemicals, Inc.: *See*—
Yamamoto, Hiroshi; and Hanato, Mitsuhiro, 5,150,652, Cl. 101-232.000.

Dair, Thomas M.: *See*—
Allendorf, Stephan C.; and Dair, Thomas M., 5,151,721, Cl. 351-121.000.

Daiwa Paint Trading Co. Ltd.: *See*—
Sakai, Hideyuki, 5,150,655, Cl. 104-89.000.

Dakin, James T.: *See*—
Farrall, George A.; Cocoma, John P.; Dakin, James T.; Duffy, Mark E.; and Berry, Tommie, Jr., 5,151,633, Cl. 315-248.000.

Dale, Nicholas C.: *See*—
Hopwell, Brian L.; Dale, Nicholas C.; and Burns, Bryan R. A., deceased, 5,150,858, Cl. 244-45.00A.

Dallas Semiconductor Corporation: *See*—
Pearson, Ronald W.; and Jones, Brian W., 5,151,644, Cl. 320-14.000.

D'Amato, Mark, to D.E.M. Controls of Canada. False bottom sump. 5,150,727, Cl. 134-104.200.

Damberg, Dirk H., to Dinoflex Manufacturing Ltd. Process for production of products formed of polymer bonded and granulated particles. 5,151,230, Cl. 264-83.000.

Damman, Martin; and Theissing, Gerhard, to Class OHG. Grain tank for a harvester thresher. 5,151,064, Cl. 460-23.000.

Dana Corporation: *See*—
Booth, Dwight E., 5,150,779, Cl. 192-106.100.

Danby, Hal C.; and Faulkner, Eric A., to Danby Medical Engineering Ltd. Pumping device having inlet and outlet valves adjacent opposed sides of a tube deforming device. 5,151,019, Cl. 417-474.000.

Danby Medical Engineering Ltd.: *See*—
Danby, Hal C.; and Faulkner, Eric A., 5,151,019, Cl. 417-474.000.

D'Andrade, Bruce M.: *See*—
Johnson, Lonnie G.; and D'Andrade, Bruce M., 5,150,819, Cl. 222-79.000.

Danek, Robert J.: *See*—
Crane, Timothy T.; Menelly, Richard A.; and Danek, Robert J., 5,151,607, Cl. 250-556.000.

Danielson, Scott E.: *See*—
Hanoka, Jack I.; and Danielson, Scott E., 5,151,377, Cl. 437-2.000.

Danno, Yoshiaki; Togai, Kazuhide; Yoshida, Masato; Ueda, Katsunori; and Shimada, Makoto, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicle engine output control method and vehicle engine. 5,151,861, Cl. 364-426.020.

Darling-Delaware Company, Inc.: *See*—
Roshanravan, Mel; and Grosskopf, Michael W., 5,151,177, Cl. 210-194.000.

Darolia, Ramgopal: *See*—
Austin, Curtiss M.; Darolia, Ramgopal; O'Hara, Kevin S.; and Ross, Earl W., 5,151,249, Cl. 420-445.000.

Dastin, Richard M.: *See*—
Durland, Scott C.; Cassano, James R.; Dastin, Richard M.; and Swanson, Roger M., 5,151,745, Cl. 355-313.000.

Davenport, Kenneth G.: *See*—
Aslam, Mohammad; and Davenport, Kenneth G., 5,151,540, Cl. 558-232.000.

Davenport, Scott A.; Ortiz, Mark V.; Chen, Linda; and Kuizenga, Dirk J., to Laserscope. Frequency doubled solid state laser having programmable pump power modes and method for controllable lasers. 5,151,909, Cl. 372-22.000.

David R. Webb Co., Inc.: *See*—
Weil, George, 5,150,746, Cl. 144-209.00B.

Davis, Archie B.; and Troilo, Joseph A., Jr. Manually contractable ring for sealing an envelope against a bead of a tire during retreading. 5,151,150, Cl. 156-384.100.

Davis-Arzac, Craig. Building system for extension of progressive housing. 5,150,552, Cl. 52-259.000.

Davis, C. Calvin: *See*—
Holloway, Sidney E., III; Crossley, Edward A., Jr.; Jones, Irby W.; Miller, James B.; Davis, C. Calvin; Behun, Vaughn D.; and Goodrich, Lewis R., Sr., 5,150,875, Cl. 248-550.000.

Davis, James K.: *See*—
Rollwitz, William L.; De Los Santos, Armando; Perry, William D.; Burrahm, Robert W.; and Davis, James K., 5,151,695, Cl. 340-870.330.

Davis-Lynch, Inc.: *See*—
Hassanzadeh, Hedayat H., 5,150,756, Cl. 166-318.000.

Davy Mckee (Sheffield) Limited: *See*—
Wilson, Geoffrey; Bradshaw, Timothy J.; and Lawson, Kenneth T., 5,150,599, Cl. 72-399.000.

Deak, Gedeon I.: *See*—
Beeson, Charles L.; Cole, Raymond T.; Deak, Gedeon I.; and Leidolf, Harbeson H., Jr., 5,151,331, Cl. 428-475.500.

DeBiasi, Mark S.; and Menelly, Richard A., to General Electric Company. Switchboards and panelboards having interlock and load selection capabilities. 5,151,842, Cl. 361-93.000.

Debie, Peter: *See*—
Range, Helmut; Beigel, Gerhard; Lotsch, Friedemann; and Debie, Peter, 5,151,038, Cl. 439-122.000.

De Bortoli, Giuseppe: *See*—
Tacchetto, Maurizio; Zorzi, Claudio; De Bortoli, Giuseppe; Pozzobon, Alessandro; and Serafin, Renato, 5,150,537, Cl. 36-50.500.

Debos, Marcel: *See*—
Ranc, Roger; Brisset, Armand; and Debos, Marcel, 5,151,126, Cl. 106-719.000.

DeCaro, Anthony A.: *See*—
Kirk, William D., III; DeCaro, Anthony A.; and Perry, Wayne E., 5,151,089, Cl. 604-192.000.

DeCastro, Carlos. Non-spillable drinking cup. 5,150,816, Cl. 220-711.000.

De Clerck, Charles E., to Hazeltine Corporation. Aluminum sheets bonded with cadmium. 5,151,332, Cl. 428-650.000.

Deffner, Dieter: *See*—
Roesky, Werner; Deffner, Dieter; and Wolter, Manfred, 5,150,985, Cl. 405-128.000.

Degani, Yinon; and Morris, John R., Jr., to AT&T Bell Laboratories. Solder paste. 5,150,832, Cl. 228-224.000.

Degen, Peter J.: *See*—
Matkovich, Vlado I.; Degen, Peter J.; Gsell, Thomas C.; Bormann, Thomas; and Rothman, Isaac, 5,151,192, Cl. 210-646.000.

Degner, Dieter: *See*—
Hermeling, Dieter; Degner, Dieter; Harreus, Albrecht; Goetz, Norbert; Wild, Jochen; Theobald, Hans; and Wolf, Bernd, 5,151,548, Cl. 560-255.000.

Deguchi, Jichio: *See*—
Hanatani, Tadashi; Sanzen, Satoru; and Deguchi, Jichio, 5,151,324, Cl. 428-323.000.

Deguchi, Mikio; Itagaki, Takushi; and Usui, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Method of making a solar cell electrode. 5,151,373, Cl. 437-2.000.

Deisenroth, Harold G.; and Drawe, Jeffrey W., to Xerox Corporation. Modular conveyor system. 5,150,781, Cl. 198-349.800.

Delachaux S.A.: *See*—
Bommart, Patrick, 5,151,202, Cl. 249-86.000.

Delco Electronics Corporation: *See*—
Akin, Timur; Myers, Bruce A.; Maki, William M.; and Palanisamy, Ponnusamy, 5,151,777, Cl. 357-81.000.
Marrah, Jeffrey J.; Manlove, Gregory J.; Kennedy, Richard A.; and Kady, Mark A., 5,151,939, Cl. 381-15.000.

Delente, Jacques J.; Behrens, Paul W.; and Hoeksema, Scot D., to Martek Corporation. Closed photobioreactor and method of use. 5,151,347, Cl. 435-3.000.

Dellanoce, Paulo T.: *See*—
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Ibsen, Robert L.; Pacropis, Donald R.; and Glace, William R., 5,151,453, Cl. 522-14.000.

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Dent, Paul W., to Ericsson-GE Mobile Communications Holding Inc. CDMA subtractive demodulation. 5,151,919, Cl. 375-1.000.

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Lobb, Ernest W.; Robbins, Bruce A.; and Depew, David L., 5,150,656, Cl. 104-162.000.

de Place, Alain, to Alcatel Transmission par Faisceaux Hertziens. Apparatus for measuring bending movements of an antenna support mast, and application thereof to controlling the pointing of a motor-driven antenna. 5,151,710, Cl. 343-766.000.

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De Santis, Dominick A.: *See*—
Bell, Jack H.; Zak, Henry C.; and De Santis, Dominick A., 5,151,212, Cl. 252-186.380.
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Deschenes, Lyse L.: *See*—
Craw, Marjory T.; McCrimmon, Kevin D.; and Deschenes, Lyse L., 5,151,402, Cl. 502-401.000.
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Desmarais, Daniel; and Wallace, Jack R., to 1-800 Geopoly. Method of playing an educational geography game. 5,150,907, Cl. 273-240.000.
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Anton, Rainer; and Harneit, Dieter, 5,151,226, Cl. 264-25.000.
Devaney, Mark J., Jr.; Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribhajan S.; and Wagner, Paul W., to Eastman Kodak Company. Drying apparatus. 5,150,955, Cl. 354-321.000.
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Dewhirst, Donald R., to Hughes Aircraft Company. Repetitive pulsed Raman cell with vibrating blade. 5,151,626, Cl. 310-331.000.
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Dicke, Rock D.: *See*—
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Diehl GmbH & Co.: *See*—
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Diels, Gaston S. M.: *See*—
Janssens, Frans E.; Diels, Gaston S. M.; and Pille, Geert M. E., 5,151,424, Cl. 514-258.000.
Digital Equipment Corporation: *See*—
Hooper, Donald F.; Finnerty, James L.; Fite, David B.; and Kundu, Snehamay, 5,151,867, Cl. 364-489.000.
Thomas, Robert E.; Varghese, George; Souza, Robert J.; and Harvey, George A., 5,151,899, Cl. 370-94.100.
Vacon, Gary; Visser, John A.; Engelse, Willem A. H.; and Metzger, Stephen D., 5,151,895, Cl. 370-85.100.
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Dimmick, Frederick, to Dimmick, Frederick. Display sign. 5,151,679, Cl. 340-326.000.
DiNinno, Frank P.; Greenlee, Mark L.; and Salzmann, Thomas N., to Merck & Co., Inc. Intermediates for preparing 2-(substituted-dibenzofuranyl and dibenzothienyl) carbapenem antibacterial agents. 5,151,512, Cl. 540-302.000.
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Jacobson, Boris S.; and DiPerna, Raymond A., 5,151,852, Cl. 363-131.000.
Discko, John, Jr.; and Dragan, William B., to Centrix, Inc. Disposable dental brush. 5,150,495, Cl. 15-167.100.
DLP, Inc.: *See*—
Jonkman, Kenneth R., 5,151,087, Cl. 604-164.000.
Dockery, Gregory A. Video multiplying system. 5,151,838, Cl. 340-310.00R.
Dr. Ing. h.c.F. Porsche AG: *See*—
Ebner, Roland; and Hannig, Dieter, 5,150,609, Cl. 73-117.300.
Hillgartner, Klaus, 5,150,633, Cl. 74-475.000.
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Mita, Seiichi; Izumita, Morishi; Ide, Hiroshi; Doi, Nobukazu; Okada, Yoshinori; and Inagaki, Yasuo, 5,151,924, Cl. 375-12.000.
Dolan, Jo A.: *See*—
Bloom, Jonathan D.; Claus, Thomas H.; DeVries, Vern G.; Dolan, Jo A.; and Dutia, Minu D., 5,151,439, Cl. 514-376.000.
Dollinger, Susan E., to Dow Chemical Company, The. Die-cuttable and dispensable deformable labels. 5,151,309, Cl. 428-40.000.
Dombrowski, Anne W.; and Koupal, Lawrence, to Merck & Co., Inc. Culture of *Asperigillus versicolor* and mutants thereof. 5,151,365, Cl. 435-254.000.
Dombrowski, James E.; and Mattingly, Phillip G., to Abbott Laboratories. N-arylation of isatins. 5,151,518, Cl. 546-107.000.
Doni, Fabrizio: *See*—
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Donovan, Joseph F.: *See*—
Gaidry, John E.; Quebedeaux, Larry J.; Donovan, Joseph F.; and Ashton, Jefferson P., 5,150,753, Cl. 166-278.000.
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Dow Chemical Company, The: *See*—
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Ciaar, Alan J., 5,151,515, Cl. 546-12.000.
Croft, Alan P.; and Koblinski, Brian D., 5,151,130, Cl. 106-778.000.
Dollinger, Susan E., 5,151,309, Cl. 428-40.000.
Glaser, R. Steven; and Bade, Jeffrey M., 5,151,866, Cl. 364-483.000.
Harris, William J.; and Hwang, Wen-Fang, 5,151,489, Cl. 528-183.000.
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Lange, Sandra V.; Denton, David P.; Weller, Joseph P.; Chauvel, Jean P., Jr.; Farquharson, Stuart; Ruhl, Harry D., Jr.; and Winter, Gregory A., 5,151,474, Cl. 526-60.000.
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Simeroth, David L.; Brink, David S.; Willis, Reid S.; and Backlund, Dale J., 5,150,601, Cl. 73-23.410.
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DowBrands Inc.: *See*—
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Dray, Robert F. Positive-type non-return valve. 5,151,282, Cl. 425-562.000.
Dresser Industries, Inc.: *See*—
Stephansky, John J.; and Sutton, John P., 5,151,200, Cl. 222-590.000.
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DSC Communications Corporation: *See*—
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Farrall, George A.; Cocoma, John P.; Dakin, James T.; Duffy, Mark E.; and Berry, Tommie, Jr., 5,151,633, Cl. 315-248.000.
Dugan, Joe W. Bale lifter and mover. 5,150,999, Cl. 414-24.500.
Duh, Quan-Yang; and Way, Lawrence W., to University of California, The Regents of the. Laparoscopic tube placement method. 5,151,086, Cl. 604-51.000.
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Beeson, Charles L.; Cole, Raymond T.; Deak, Gedeon I.; and Leidolf, Harbeson H., Jr., 5,151,331, Cl. 428-475.500.
Blackwell, Daniel C.; and Koskol, Joseph E., 5,150,739, Cl. 139-452.000.
Foster. James P.; and Jennings, Philip V., 5,150,541, Cl. 43-131.000.
Fusselman, David F.; and Townsend, Peter K., 5,151,036, Cl. 439-108.000.
Hekker, Roeland M. T.; Livny, Izhak M.; and Mercurio, Gregory S., 5,151,822, Cl. 359-559.000.
Hobbs, Frank W., Jr.; and Trainor, George L., 5,151,507, Cl. 536-23.000.
Lau, Hon-Peng P.; and Miller, Warren K., 5,151,348, Cl. 435-7.920.
Schnitzer, Tadeusz E., 5,150,640, Cl. 83-583.000.
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Okazaki, Susumu; and Kurosaki, Akito, 5,151,263, Cl. 423-659.000.
DuPriest, Mark T.; Conrow, Raymond E.; and Kuzmich, Daniel, to Alcon Laboratories, Inc. Intermediates in the preparation of chiral spirofluorenehydantoins. 5,151,544, Cl. 560-10.000.
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Payne, Robert J.; and Yoppolo, Robert A., 5,150,602, Cl. 29-623.200.
Duranton, Marc A. G.: *See*—
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Durfee, David L., to Durfee, Susan M. Clamping mechanism in a vise jaw accessory system for attaching and releasing vise accessories while maintaining positional accuracy of the accessories. 5,150,888, Cl. 269-254.0CS.
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Durkin, Thomas B.; and Biasone, Frank, to Asten Group, Inc. Multilayered papermaker's fabric for thru-dryer application. 5,151,316, Cl. 428-213.000.
Durland, Scott C.; Cassano, James R.; Dastin, Richard M.; and Swanson, Roger M., to Xerox Corporation. Sheet control mechanism for use in an electrophotographic printing machine. 5,151,745, Cl. 355-313.000.
Dutia, Minu D.: *See*—
Bloom, Jonathan D.; Claus, Thomas H.; DeVries, Vern G.; Dolan, Jo A.; and Dutia, Minu D., 5,151,439, Cl. 514-376.000.
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Webb, Maria L.; and Monshizadegan, Hossain, 5,151,502, Cl. 530-402.000.
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Earl, Harold A.; and Banks, William B., to National Research Development Corporation. Process for producing composite materials. 5,151,238, Cl. 264-136.000.
Earley Marketing Limited: *See*—
Harris, Sydney J.; and Woolnough, Andrew C., 5,150,813, Cl. 220-480.000.
Eastman Kodak Company: *See*—
Begley, William J.; Chen, Teh-hsuan; Ling, Hans G.; Harder, John W.; and Bowne, Arlyce T., 5,151,343, Cl. 430-382.000.
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Jamzadeh, Fereidoon S.; Chowdry, Arun; and Johnson, Kevin M., 5,151,717, Cl. 346-157.000.
Johnson, Kevin M.; and Kowalczyk, Michael S., 5,151,737, Cl. 355-211.000.
Kemp, David B.; McCormick, Christopher P.; and Fraser, Mark D., 5,151,730, Cl. 354-275.000.
Lee, Benedict M.; and Harris, James E., 5,150,723, Cl. 131-342.000.
Moore, Jack S., Jr.; Cox, Johnny R.; and Williams, Mark L., 5,150,621, Cl. 73-863.910.
VanSlyke, Steven A., 5,151,629, Cl. 313-504.000.
Ebara, Ryuichiro; Nakamoto, Hideo; Ukawa, Naohiko; Yamada, Tamotsu; and Nishimura, Yasuo, to Mitsubishi Jukogyo Kabushiki Kaisha. Pd-added austenitic stainless steel for use for high temperature concentrated sulfuric acid. 5,151,248, Cl. 420-35.000.
Ebbing, Peter; and Birang, Manoocher, to Applied Materials, Inc. Method and apparatus for endpoint detection in a semiconductor wafer etching system. 5,151,584, Cl. 250-201.400.
Ebinuma, Ryuichi, to Canon Kabushiki Kaisha. Optical fiber sealing assembly. 5,151,967, Cl. 385-138.000.
Ebner, Roland; and Hannig, Dieter, to Dr. Ing. h.c.F. Porsche AG. On board computer for a motor vehicle. 5,150,609, Cl. 73-117.300.
ECC America Inc.: *See*—
Rice, C. Arlyn, 5,151,124, Cl. 106-416.000.
EDAP International, S.A.: *See*—
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Dory, Jacques, 5,150,712, Cl. 128-660.030.
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Edwards, Scott G.: *See*—
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Egawa, Noboru, to Oki Electric Industry Co., Ltd. Noise absorbing circuit suitable for semiconductor integrated circuits. 5,151,615, Cl. 307-443.000.
Egli, Anton, to Geberit AG; and "Keramag" Keramischewerke AG. Double pipe connection on plastic pipes. 5,150,926, Cl. 285-110.000.
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Eitner, Joseph G., Jr.; and Tice, Robert J., Jr., to Wellcome Foundation Limited, The. Mixing head for dispensing an actine ingredient. 5,150,822, Cl. 222-145.000.
Elberson, Joyce E.; and Ritchey, Mary F. Hospital gown. 5,150,477, Cl. 2-114.000.
Elco Corporation: *See*—
McClune, Donald W., 5,151,056, Cl. 439-851.000.
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Yamashita, Hiroki; and Emori, Kiyoshi, 5,151,735, Cl. 355-207.000.

Enami, Kazumasa: *See*—
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

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Levy, Guy, 5,151,029, Cl. 433-29.000.
Levy, Guy, 5,151,031, Cl. 433-226.000.

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Bergmann, Gyorgy; Hivessy, Geza; Homola, Tamas; Bakay, Arpad; and Horvath, Mihaly, 5,150,749, Cl. 165-115.000.

Engeler, William E., to General Electric Company. Method of generating, in the analog regime, weighted summations of digital signals. 5,151,970, Cl. 395-24.000.

Engelse, Willem A. H.: *See*—
Vacon, Gary; Visser, John A.; Engelse, Willem A. H.; and Metzger, Stephen D., 5,151,895, Cl. 370-85.100.

English, Kris M.: *See*—
Ward, Jefferson P.; Harmon, J. P.; English, Kris M.; and Christensen, Kenneth L., 5,151,715, Cl. 346-140.00R.

Englund, Sven R.: *See*—
Bowman, Donald J.; Crane, Jerry D.; Edwards, Scott G.; Edwards, Kathryn M.; and Englund, Sven R., 5,151,896, Cl. 370-85.130.

Engstrom, Sven; Lindman, Bjorn; and Larsson, Kare, to Fluid-Carbon International AB. Method of preparing controlled-release preparations for biologically active materials and resulting compositions. 5,151,272, Cl. 424-450.000.

Enoki, Takatomo; Shigekawa, Naoteru; and Arai, Kunihiro, to Nippon Telegraph and Telephone Corporation. Heterojunction field-effect transistor. 5,151,757, Cl. 357-22.000.

Entwistle Corporation, The: *See*—
Swartz, Henry D., 5,151,149, Cl. 156-379.800.

Environmental Research Institute of Michigan: *See*—
Upatnieks, Juris, 5,151,800, Cl. 359-14.000.

Ericsson-GE Mobile Communications Holding Inc.: *See*—
Dent, Paul W., 5,151,919, Cl. 375-1.000.

Ermisse, Daniel J. A.: *See*—
Boquet, Jean P. M.; Ermisse, Daniel J. A.; and Cattin, Gabriel J. L., 5,150,548, Cl. 51-313.000.

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Esteve, Xavier, to Meseltron S.A. Arrangement for measuring the diameter of cylindrical parts during the machining thereof. 5,150,545, Cl. 51-165.740.

Etheridge, Johnny E. Material level sensing device. 5,150,613, Cl. 73-291.000.

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Okazaki, Makoto; and Eto, Koji, 5,151,940, Cl. 381-43.000.

Etzbach, Karl-Heinz: *See*—
Beck, Karin H.; Etzbach, Karl-Heinz; and Schmidt, Hans-Werner, 5,151,516, Cl. 546-37.000.

Euler, John W.: *See*—
Singh, Devinder; Hardaway, Anthony H.; Euler, John W.; and Pastryk, Jim J., 5,150,588, Cl. 68-23.500.

Ewikon Entwicklung und Konstruktion GmbH & Co. KG: *See*—
Muller, Walter, 5,151,025, Cl. 425-199.000.

Exxon Chemical Patents Inc.: *See*—
Struglinski, Mark J., 5,151,204, Cl. 252-52.00R.
White, Donald A., 5,151,467, Cl. 525-215.000.

Exxon Research and Engineering Company: *See*—
Chiang, Long Y.; and Lai, Wen-Yih F., 5,151,478, Cl. 526-258.000.
Vaughn, Stephen N.; Siskin, Michael; Katritzky, Alan; Brons, Glen; Reynolds, Steve N.; Culross, Claude C.; and Neskora, Dan R., 5,151,173, Cl. 208-430.000.

Eymuller, Helmut: *See*—
Mann, Egon; Eymuller, Helmut; and Stutzle, Siegfried, 5,151,068, Cl. 475-322.000.

EZ Paintr Corporation: *See*—
Burns, Fredrick B., 5,151,229, Cl. 264-51.000.

Ezel Inc.: *See*—
Kumagai, Ryohei, 5,151,794, Cl. 358-447.000.

Faerber, Manfred; Wienchol, Otto; and Schleicher, Bernd, to Webasto AG Fahrzeugtechnik. Flexible thermoplastic rack bar. 5,150,631, Cl. 74-422.000.

FAG Kugelfischer Georg Schafer KgaA: *See*—
Masur, Ernst; Ruoff, Gottfried; and Planek, Werner, 5,150,973, Cl. 384-448.000.

Falcone, Danielia T.: *See*—
Buell, Kenneth B.; Clear, Sandra H.; and Falcone, Danielia T., 5,151,092, Cl. 604-385.200.

Fanuc Ltd.: *See*—
Iehisa, Nobuaki; and Yamazaki, Etsuo, 5,151,916, Cl. 372-61.000.
Seki, Masaki; Samukawa, Koji; and Hanaoka, Osamu, 5,151,864, Cl. 364-474.230.

Fanuc Ltd: *See*—
Torii, Nobutoshi; and Wakio, Hiroshi, 5,151,608, Cl. 250-561.000.

Farid, Payman: *See*—
Behling, James R.; Farid, Payman; Khanna, Ish; Medich, John R.; Prunier, Mike; Scaros, Mike G.; and Weier, Richard M., 5,151,519, Cl. 546-219.000.

Farinotti, Robert: *See*—
Reveilleau, Pierre; Mahuzier, Georges; Chalom, Joseph; Farinotti, Robert; Tod, Michel; and Barre, Edith, 5,151,517, Cl. 546-66.000.

Farling, Duane J.; and Smith, Gary A., to Eastman Kodak Company. Single unit apparatus for chilling, drying and incubating photographic emulsions. 5,150,533, Cl. 34-62.000.

Faroudja, Yves C. Digital television with enhancement. 5,151,783, Cl. 358-133.000.

Farquharson, Stuart: *See*—
Lange, Sandra V.; Denton, David P.; Weller, Joseph P.; Chauvel, Jean P., Jr.; Farquharson, Stuart; Ruhl, Harry D., Jr.; and Winter, Gregory A., 5,151,474, Cl. 526-60.000.

Farrall, George A.; Cocoma, John P.; Dakin, James T.; Duffy, Mark E.; and Berry, Tommie, Jr., to General Electric Company. Self-extinguishing gas probe starter for an electrodeless high intensity discharge lamp. 5,151,633, Cl. 315-248.000.

Farrell, David: *See*—
Slife, Jimmy D.; and Farrell, David, 5,151,935, Cl. 379-240.000.

Farrell, William M., to General Electric Company. Gas turbine powerplant. 5,150,567, Cl. 60-39.020.

Farrow, Robert I.; and Johnson, Drey, to Concept Design. Cassette loader with leader tape extraction and transfer, and method. 5,150,847, Cl. 242-56.00R.

Farrow, Robert I.; DeMint, Paul; Johnson, Drey; Gaude, Robert; and McNeill, Ray O., to Concept Design. Cassette loader with improved leader tape extraction and method. 5,150,849, Cl. 242-56.00R.

Fasi, Roland; and Nielsen, Milo A., to Nestec S.A. Process for reducing hydrolysed protein chlorohydrin content. 5,151,503, Cl. 530-412.000.

Fauke, Allen R.: *See*—
Buriks, Rudolf S.; and Fauke, Allen R., 5,151,195, Cl. 210-705.000.

Faulkner, Eric A.: *See*—
Danby, Hal C.; and Faulkner, Eric A., 5,151,019, Cl. 417-474.000.

Fearon, Karen L.: *See*—
Stec, Wojciech J.; Uznanski, Bogdan; Bergot, B. John; Hirschbein, Bernard L.; and Fearon, Karen L., 5,151,510, Cl. 536-27.000.

Federal-Mogul Corporation: *See*—
Wolbers, Eugene A.; and Drewes, Douglas A., 5,150,778, Cl. 192-98.000.

Fennhoff, Gerhard; Jakob, Wolfgang; Ehlert, Manfred; and Freitag, Dieter, to Bayer Aktiengesellschaft. Purification of polycarbonate and polyester carbonate waste. 5,151,452, Cl. 521-48.000.

Ferguson, Keith D.: *See*—
Williams, John J. A.; Shacklock, Frank W.; and Ferguson, Keith D., 5,150,589, Cl. 68-23.700.

Ferkany, Michael A., to Biomedical Devices Company. Fluid collecting and dispensing system. 5,151,184, Cl. 210-514.000.

Ferrari, Alberto. Backpack spraying equipment. 5,150,837, Cl. 239-153.000.

Ferraro, Andrew G., to Reiss Media Enterprises. Control system for satellite delivered pay-per-view television system. 5,151,782, Cl. 358-86.000.

Fettis, Michael E.; and Cottrell, Paul R., to UOP. Moving bed regeneration process with separate dispersion and chloriding steps. 5,151,392, Cl. 502-37.000.

Fiber Delivery Concepts, Inc.: *See*—
Walker, James P.; Aucoin, Jack; and Drew, Randall, 5,151,962, Cl. 385-86.000.

Fibra-Sonics, Inc.: *See*—
Khek, Sokhuom, 5,151,084, Cl. 604-22.000.
Pichler, Robert H., 5,151,083, Cl. 604-22.000.

Filo, Andrew S., to Simon Marketing, Inc. Imaging device and method for developing, duplicating and printing graphic media. 5,151,595, Cl. 250-316.100.

Filosa, Philip C.: *See*—
Nagengast, William E.; and Filosa, Philip C., 5,151,849, Cl. 362-61.000.

Fina Technology, Inc.: *See*—
Tees, Alistair A.; and Kenney, Glen E., 5,151,111, Cl. 55-164.000.

Findeis, Gunter; Jacob, Friedrich; and Schulz, Eberhard, to Agfa-Gevaert Aktiengesellschaft. Apparatus and method for copying photographic masters at variable magnifications. 5,151,733, Cl. 355-45.000.

Finello, Duane, to United States of America, Air Force. Supercapacitor. 5,151,848, Cl. 361-502.000.

Finkelmann, Heino; and Messner, Bernfried, to Merck Patent Gesellschaft mit beschrankter Haftung. Polymers having liquid crystal phases containing 2-cyanoacrylic acid ester group. 5,151,481, Cl. 526-298.000.

Finkenzeller, Ulrich: *See*—
Reiffenrath, Volker; and Finkenzeller, Ulrich, 5,151,213, Cl. 252-299.600.

Finnerty, James L.: *See*—
Hooper, Donald F.; Finnerty, James L.; Fite, David B.; and Kundu, Snehamay, 5,151,867, Cl. 364-489.000.

Firmenich S.A.: *See*—
Giersch, Wolfgang K.; Blanc, Pierre-Alain; and Schulte-Elte, Karl-Heinrich, 5,151,410, Cl. 512-9.000.

Fischer, Christof D.; Petutschnig, Wolfgang; and Wojik, Karl, to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. Hans List. Cylinder head of an internal combustion engine. 5,150,672, Cl. 123-90.220.

Fischer, Dennis: *See*—
Perilloux, Bruce; Bloom, Arnold; Fischer, Dennis; Giammona, Larry; and Johnston, Thomas F., 5,151,917, Cl. 372-102.000.

Fischer, Moritz, to Fischer Moritz AG. Tread element for moving pavement or escalator. 5,150,780, Cl. 198-333.000.

Fischer Moritz AG: *See*—
Fischer, Moritz, 5,150,780, Cl. 198-333.000.

Fisher, Gary R.: *See*—
Gunst, Ole; and Fisher, Gary R., 5,150,752, Cl. 166-88.000.
Fisher & Paykel Limited: *See*—
Williams, John J. A.; Shacklock, Frank W.; and Ferguson, Keith D., 5,150,589, Cl. 68-23.700.
Fisher, Robert W.: *See*—
Hvezda, Jaroslav M.; Fisher, Robert W.; Olszewski, Edward J.; Morrin, Hugh F. C.; and Glover, Richard J., 5,151,961, Cl. 385-60.000.
Fishler, Mark K.; Rancoule, Gilbert; Park, Han K.; and Robinson, Quentin K., to Vesuvius Crucible Company. Prevention of erosion and alumina build-up in casting elements. 5,151,201, Cl. 222-600.000.
Fite, David B.: *See*—
Hooper, Donald F.; Finnerty, James L.; Fite, David B.; and Kundu, Snehamay, 5,151,867, Cl. 364-489.000.
Fitzpatrick, David: *See*—
Babiuk, Lorne; van den Hurk, Sylvia; Zamb, Tim; and Fitzpatrick, David, 5,151,267, Cl. 424-89.000.
Fitzwater, Edwin. Air gun pellet design. 5,150,909, Cl. 273-428.000.
Flakee Mills, Inc.: *See*—
Williams, Rick L.; Leggott, Merton R.; and Bailey, Richard G., 5,151,285, Cl. 426-241.000.
Flamig, Duane P.: *See*—
Harms, Steven E.; Flamig, Duane P.; and Griffey, Richard H., 5,151,655, Cl. 324-309.000.
Flamini, Alberto; and Poli, Nicola, to Consiglie Nazionale delle Ricerche. Synthesis of the carbanion 1,1,2-tricyano-2-(3,4-dicyano-5-imino-2,5-dihydro-1H-pyrrol-2-ylidene) ethanide. 5,151,527, Cl. 548-451.000.
Flanigan, David A.; and Boadway, John D., to Conoco Specialty Products Inc. Method and apparatus for reduction of particle disintegration. 5,151,079, Cl. 494-27.000.
Fleissneer, Gerold. Air mixer apparatus. 5,150,535, Cl. 34-155.000.
Flint, Lori B.: *See*—
Homonoff, Edward C.; Meierhoefer, Alan W.; and Flint, Lori B., 5,151,320, Cl. 428-284.000.
Flohr, Peter, to Heinrich Kopp GmbH & Co. KG. Power circuit breaker. 5,151,674, Cl. 335-16.000.
Flores, Carlos R. Doctor-blade assembly for flexographic press. 5,150,651, Cl. 101-207.000.
Fluid-Carbon International AB: *See*—
Engstrom, Sven; Lindman, Bjorn; and Larsson, Kare, 5,151,272, Cl. 424-450.000.
Focke & Co.: *See*—
Focke, Heinz; and Bretthauer, Hans-Jurgen, 5,150,720, Cl. 131-329.000.
Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz, 5,151,073, Cl. 493-79.000.
Focke, Heinz; and Bretthauer, Hans-Jurgen, to Focke & Co. Cuboidal pack, especially hinge lid pack for cigarettes. 5,150,720, Cl. 131-329.000.
Focke, Heinz, to Focke & Co. (GmbH & Co.). Apparatus for the production of cigarette packs. 5,151,073, Cl. 493-79.000.
Foehse, Karen B.; Efstathiou, John D.; and Stoll, James R., to General Mills, Inc. High soluble fiber barley expanded cereal and method of preparation. 5,151,283, Cl. 426-93.000.
Fogt, James F.: *See*—
Clendenin, Harry B.; and Fogt, James F., 5,151,018, Cl. 417-312.000.
Fokker Aircraft B.C.: *See*—
Kaptein, Dick, 5,150,855, Cl. 244-1.00N.
Foley, Michael F.: *See*—
Bernardon, Edward; and Foley, Michael F., 5,151,277, Cl. 425-112.000.
Ford, Benjamin J.: *See*—
Ford, Dan; and Ford, Benjamin J., 5,150,745, Cl. 141-241.000.
Ford, Dan; and Ford, Benjamin J. Container and method for filling batteries with electrolyte. 5,150,745, Cl. 141-241.000.
Ford Motor Company: *See*—
Hickey, John C., 5,150,842, Cl. 239-585.400.
Ford New Holland, Inc.: *See*—
Bich, Gary L.; and Hall, Larry D., 5,150,564, Cl. 56-98.000.
Bich, Gary L., 5,150,565, Cl. 56-102.000.
Forgette, Sidney M. Theft guard for cable reels. 5,150,790, Cl. 206-4.000.
Foster, James P.; and Jennings, Philip V., to Du Pont de Nemours, E. I., and Company. Device for killing insects. 5,150,541, Cl. 43-131.000.
Foster, Walter W.; Boatwright, Gregory L.; and Lewis, Thomas E., to Reynolds Metals Company. Coated article production system. 5,151,147, Cl. 156-244.120.
Fox, Neil A., to Smiths Industries Public Limited Company. Radiation-emitting panels and display assemblies. 5,150,965, Cl. 362-260.000.
Framatome: *See*—
de Seroux, Nicolas; and Limouzin, Dominique, 5,151,245, Cl. 376-271.000.
France Telecom Etablissement Autonome de Droit Public (Centre National d'Etudes des Telecommunications): *See*—
Riviere, Luc, 5,151,957, Cl. 385-41.000.
Franco, Luis P.: *See*—
Bleich, Herman E.; Franco, Luis P.; and Sanders, Ian L., 5,151,294, Cl. 427-11.000.
Frank, Dieter: *See*—
Kent, Carole L.; and Frank, Dieter, 5,151,302, Cl. 427-140.000.
Frank L. Wells Company: *See*—
Wentzek, Horst; and Kozak, Michael, 5,150,600, Cl. 72-426.000.
Frank, Lee F.: *See*—
Devaney, Mark J., Jr.; Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribhajan S.; and Wagner, Paul W., 5,150,955, Cl. 354-321.000.
Frank, Lenore G. R.: *See*—
Nickerson, Mark A.; Poole, John S.; and Frank, Lenore G. R., 5,151,178, Cl. 210-198.200.
Frank, Wolfgang; Loffler, Johannes; and Holle, Norbert, to Metallgesellschaft AG. Control spear for use in a passage for conducting dust-containing hot gases. 5,150,729, Cl. 137-340.000.
Frank's International Ltd.: *See*—
Moody, Victor; and Jenner, Andrew, 5,150,642, Cl. 81-57.200.
Franssen, Emile; and Reisberg, Barry. System for diagnosis and staging of dementia by neurologic examination. 5,150,716, Cl. 128-774.000.
Frantz, Douglas C., to Chrysler Corporation. Enhanced charging system diagnostic method. 5,151,647, Cl. 322-99.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef; and Oellerer, Friedrich, 5,151,002, Cl. 414-339.000.
Franzke, Klaus: *See*—
Kohler, Rolf; Kratt, Alfred; and Franzke, Klaus, 5,150,698, Cl. 123-690.000.
Fraser, Mark D.: *See*—
Kemp, David B.; McCormick, Christopher P.; and Fraser, Mark D., 5,151,730, Cl. 354-275.000.
Frater, Georg; and Helmlinger, Daniel, to Givaudan Corporation. Tricyclic ketones and fragrance compositions containing same. 5,151,411, Cl. 512-15.000.
Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See*—
Baumeister, Joachim; and Schrader, Hartmut, 5,151,246, Cl. 419-2.000.
Maier, Dieter; Egner, Harald; Frohlich, Stefan; and Hoffmann, Jurgen, 5,151,241, Cl. 264-314.000.
Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung EV: *See*—
Grobe, Anneliese; and Chmiel, Horst, 5,151,193, Cl. 210-651.000.
Fredericks, Kenneth J.; and Lynch, Kenneth R., to International Business Machines Corp. Managing a serial link in an input/output system which indicates link status by continuous sequences of characters between data frames. 5,151,977, Cl. 395-200.000.
Freeman, Stephen, to Crosfield Electronics Limited. Electronic brush generation. 5,151,686, Cl. 340-703.000.
Freitag, Dieter: *See*—
Fennhoff, Gerhard; Jakob, Wolfgang; Ehlert, Manfred; and Freitag, Dieter, 5,151,452, Cl. 521-48.000.
French State Represented by the Minister of Post, Telecommunications and Space (Centre National d'Etudes des Telecommunications): *See*—
Pophillat, Lucien, 5,151,698, Cl. 341-52.000.
Frescka, Ede: *See*—
Perenyi, Andras; Utpal, Goswami; Arato, Mihaly; Frescka, Ede; Knoll, Jozsef; and Bela, D. Arpad, 5,151,419, Cl. 514-226.200.
Freyne, Eddy J. E.: *See*—
Venet, Marc G.; Sanz, Gerard C.; Raeymaekers, Alfons H. M.; and Freyne, Eddy J. E., 5,151,421, Cl. 514-249.000.
Friedmann, Jacob, to Iscar Ltd. Cutting insert and a cutting tool assembly incorporating such an insert. 5,150,992, Cl. 407-110.000.
Friedmann, Oswald, to Luk Lamellen und Kupplungsbau GmbH. Apparatus for transmitting torque between the engine and the transmission of a motor vehicle. 5,150,777, Cl. 192-70.170.
Friedmann, Oswald: *See*—
Maucher, Paul; and Friedmann, Oswald, 5,151,065, Cl. 464-68.000.
Fries, William M., to Hughes Aircraft Company. Self-leveling reflow solder head with double pivot. 5,150,827, Cl. 228-44.700.
Frisbie, Milo W.; Nickerson, Larry A.; and Swapp, Mavin C., to Motorola, Inc. Packaged semiconductor device handler. 5,151,650, Cl. 324-158.00F.
Frohlich, Jorn, legal representative: *See*—
Wismer-Pedersen, Jorgen, deceased; and Frohlich, Jorn, legal representative, 5,151,500, Cl. 530-385.000.
Frohlich, Stefan: *See*—
Maier, Dieter; Egner, Harald; Frohlich, Stefan; and Hoffmann, Jurgen, 5,151,241, Cl. 264-314.000.
Frye, Gregory C.: *See*—
Bein, Thomas; Brown, Kelly D.; Frye, Gregory C.; and Brinker, Charles J., 5,151,110, Cl. 55-75.000.
Fu, Chia-Min; Maholland, Michael K.; and Lowery, Richard E., to Phillips Petroleum Company. Reactivation of spent, metal-containing cracking catalysts. 5,151,391, Cl. 502-27.000.
Fuchikami, Takamasa; and Urata, Hisao, to Sagami Chemical Research Center. Fluorine-containing α,β-bifunctional compounds and process for their production. 5,151,535, Cl. 554-226.000.
Fuchs, Erwin, to Weingartner Maschinenbau Gesellschaft m.b.H. Process for manufacturing inner and outer parts for a rotary piston machinein which the inner and outer parts have parallel axes. 5,150,518, Cl. 29-888.040.
Fujan, Steven J.; and Loeber, Frederick W., to Terex Corporation. Safety modular cab system for a large, off road-machine. 5,150,942, Cl. 296-190.000.
Fuji Electric Co., Ltd.: *See*—
Tatebayashi, Tsuneo; Uno, Yoshio; and Hiei, Masaichi, 5,150,704, Cl. 128-395.000.
Fuji Kikai Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Hiroshi; and Hanato, Mitsuhiro, 5,150,652, Cl. 101-232.000.

Fuji Photo Film Co., Ltd.: *See*—
Abe, Akira; Mihayashi, Keiji; and Ichijima, Seiji, 5,151,344, Cl. 430-383.000.
Adachi, Yuuma, 5,151,795, Cl. 358-448.000.
Agano, Toshitaka, 5,151,597, Cl. 250-327.200.
Hasebe, Kazunori, 5,151,345, Cl. 430-525.000.
Kohda, Katsuhiro; and Matsuda, Terumi, 5,151,604, Cl. 250-484.100.
Koide, Tomoyuki; Matsuda, Naoto; Nakamura, Koki; and Kojima, Tetsuro, 5,151,357, Cl. 430-610.000.
Okino, Yoshiharu; and Okazaki, Yoji, 5,151,714, Cl. 346-108.000.
Sakanoue, Kei; and Hirano, Tsumoru, 5,151,356, Cl. 430-548.000.
Saotome, Shigeru, 5,151,596, Cl. 250-327.200.
Sasaki, Hidemi, 5,151,727, Cl. 354-76.000.
Seto, Shunichi, 5,151,755, Cl. 356-414.000.
Takatori, Naoki; and Orimoto, Masaaki, 5,151,790, Cl. 358-225.000.
Terai, Fumitaka; Yamagami, Hiroyuki; Uchino, Nobuhiko; and Okazaki, Masaki, 5,151,346, Cl. 430-546.000.
Yamada, Minoru; and Toyoda, Takashi, 5,151,731, Cl. 354-324.000.

Fuji Photo Optical Co., Ltd.: *See*—
Ishiguro, Masaaki; Tanaka, Toshizumi; and Takagi, Yukio, 5,150,715, Cl. 128-662.060.

Fuji Xerox Co., Ltd.: *See*—
Akutsu, Eiichi; Shoji, Yoshio; Soga, Hiroo; and Ando, Shigehito, 5,151,719, Cl. 346-160.100.
Miyata, Masahiko, 5,151,949, Cl. 382-9.000.
Mukai, Toshio; Yamashita, Yoshiro; and Suzuki, Takanori, 5,151,528, Cl. 549-31.000.

Fujikawa, Satoshi: *See*—
Ninomiya, Hiroshi; and Fujikawa, Satoshi, 5,150,637, Cl. 74-335.000.

Fujikiko Kabushiki Kaisha: *See*—
Matsuura, Hiroshi, 5,150,870, Cl. 248-421.000.
Negi, Yoshitaka; and Matsuura, Hiroshi, 5,150,871, Cl. 248-429.000.

Fujimoto, Hiroaki: *See*—
Sakamoto, Noriyasu; Kisida, Hirosi; Fujimoto, Hiroaki; Umeda, Kimitoshi; and Matsuo, Noritada, 5,151,428, Cl. 514-277.000.

Fujimoto, Hitoshi, to Kabushiki Kaisha Toshiba. Image forming apparatus capable of automatic control of developer density. 5,151,740, Cl. 355-246.000.

Fujioka, Toshinori, to Hitachi, Ltd. Automatic transaction machine system for checking card data and embossed characters. 5,151,582, Cl. 235-469.000.

Fujita, Akira; and Kato, Hisao, to Mitsubishi Denki Kabushiki Kaisha. System for adjusting horizontal deviations of an elevator car during vertical travel. 5,151,562, Cl. 187-134.000.

Fujita, Minoru, to Hitachi Maxell, Ltd. Disk cartridge shutter. 5,151,894, Cl. 369-291.000.

Fujita, Yoshiyuki; and Sakane, Katsunobu, to Toyoda Gosei Co., Ltd. Steering wheel. 5,150,920, Cl. 280-777.000.

Fujitsu Limited: *See*—
Chiba, Takahiro, 5,150,734, Cl. 137-567.000.
Chujo, Kaoru; Kakuishi, Mitsuo; and Fukui, Hirokazu, 5,151,937, Cl. 379-410.000.
Hasegawa, Susumi; Mizoshita, Yoshifumi; and Takaishi, Kazuhiko, 5,151,639, Cl. 318-568.180.
Matsuda, Genichi; and Sugii, Takesi, 5,151,326, Cl. 128-336.000.
Matsui, Kunio, 5,151,857, Cl. 364-419.000.
Okazaki, Makoto; and Eto, Koji, 5,151,940, Cl. 381-43.000.
Sato, Shouichi, 5,151,676, Cl. 338-61.000.
Suzuki, Hideo, 5,151,897, Cl. 370-85.130.
Takeuchi, Atsushi, 5,151,589, Cl. 250-213.00A.
Tanaka, Yoshinori; Taniguchi, Tomohiko; Amano, Fumio; Ohta, Yasuji; and Unagami, Sigeyuki, 5,151,968, Cl. 395-2.000.
Taniguchi, Yoshiaki; Watanabe, Masaki; Iizawa, Ryuji; and Mori, Fumitoshi, 5,151,860, Cl. 364-424.050.
Yaguchi, Masanori, 5,151,743, Cl. 355-288.000.
Yamauchi, Tunenori, 5,151,765, Cl. 357-34.000.
Yokoyama, Naoki; and Imamura, Kenichi, 5,151,618, Cl. 307-471.000.

Fujiwara, Genichi, to Mitsubishi Denki Kabushiki Kaisha. Voice frequency communication apparatus. 5,151,923, Cl. 375-5.000.

Fujiwara, Shozo: *See*—
Wakita, Naohide; Iwai, Yoshio; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Johten, Kazuhiro; Kimura, Satoshi; and Fujiwara, Shozo, 5,151,803, Cl. 359-56.000.

Fujiwara, Takayoshi; and Honma, Hisanori, to Kabushiki Kaisha Toshiba. Fluid compressor with adjustable bearing support plate. 5,151,021, Cl. 418-93.000.

Fujiwara, Yoshihito: *See*—
Nishiguchi, Masayuki; Fujiwara, Yoshihito; and Umezawa, Tomoko, 5,151,941, Cl. 381-46.000.

Fukahori, Hidehiko: *See*—
Tokunaga, Tatsuyuki; Aoyama, Keisuke; Fukahori, Hidehiko; Suda, Yasuo; and Akashi, Akira, 5,151,583, Cl. 250-201.200.

Fukuchi, Takakazu: *See*—
Suginoya, Mitsuru; Kamamori, Hitoshi; and Fukuchi, Takakazu, 5,151,379, Cl. 427-39.000.

Fukuda, Nobuhiro; Kobayashi, Sadao; Miyachi, Kenji; Takenouchi, Hidemi; Kawahara, Yoji; and Teramoto, Takayuki, to Mitsui Toatsu Chemicals, Inc. Method for forming window material for solar cells and method for producing amorphous silicon solar cell. 5,151,255, Cl. 422-186.050.

Fukui, Hirokazu: *See*—
Chujo, Kaoru; Kakuishi, Mitsuo; and Fukui, Hirokazu, 5,151,937, Cl. 379-410.000.

Fukumochi, Yasuaki: *See*—
Uenishi, Akio; Yamaguchi, Hiroshi; and Fukumochi, Yasuaki, 5,151,762, Cl. 357-23.400.

Fukushima, Hitoshi: *See*—
Kakutani, Toshiaki; Yanase, Nobuyuki; Fukushima, Hitoshi; and Takahata, Toshiya, 5,151,741, Cl. 355-257.000.

Fukushima, Kyouko; Shirota, Koromo; and Koike, Shouji, to Canon Kabushiki Kaisha. Ink, ink jet recording method employing the same, and apparatus or tool employing the same. 5,151,128, Cl. 106-20.000.

Fulbreth, Werner; Leeb, Richard; Radau, Manfred; and Stammberger, Willi, to Hoechst Aktiengesellschaft. Stabilized medicinal substances, a process for the preparation thereof, and stable medicinal formulations. 5,151,433, Cl. 514-299.000.

Fuller, George T.: *See*—
Bowman, Harold M.; and Fuller, George T., 5,150,984, Cl. 404-26.000.

Funada, Fumiaki: *See*—
Koden, Mitsuhiro; Kuratate, Tomoaki; Funada, Fumiaki; Sakaguchi, Kazuhiko; and Kitamura, Tohru, 5,151,214, Cl. 252-299.610.

Furuhashi, Michio: *See*—
Ohnaka, Hidemi; Tanaka, Masaaki; Kato, Yuuichi; Furuhashi, Michio; Satoya, Koichi; and Ooi, Yasuhiro, 5,150,693, Cl. 123-559.300.

Furukawa Electric Co., Ltd., The: *See*—
Okada, Tetsuya, 5,151,042, Cl. 439-169.000.

Furukawa, Noboru: *See*—
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000.

Furuya, Hiroyuki: *See*—
Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000.

Furuya, Kouhei: *See*—
Sato, Aiya; Sugano, Michihiro; Furuya, Kouhei; Oshima, Takeshi; Kuwano, Harumitsu; Hata, Tadashi; and Haruyama, Hideyuki, 5,151,529, Cl. 549-354.000.

Furuya, Masato: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; and Uchiyama, Yuji, 5,151,781, Cl. 358-45.000.

Fuse, Seisaku: *See*—
Ozawa, Ryutaro; Hayakawa, Tomoya; Kato, Noriko; Kobayashi, Soichi; and Fuse, Seisaku, 5,151,289, Cl. 426-557.000.

Fushimi, Kazuo; Kitakizaki, Kaoru; and Kawakami, Kazuhiko, to Kabushiki Kaisha Meidensha. Fuel cell utilizing solidous electrolyte. 5,151,334, Cl. 429-32.000.

Fusselman, David F.; and Townsend, Peter K., to Du Pont de Nemours, E. I., and Company. Connectors with ground structure. 5,151,036, Cl. 439-108.000.

Futaki, Yoshiki: *See*—
Kobayashi, Noboru; and Futaki, Yoshiki, 5,151,057, Cl. 440-38.000.

G. D. Searle & Co.: *See*—
Behling, James R.; Farid, Payman; Khanna, Ish; Medich, John R.; Prunier, Mike; Scaros, Mike G.; and Weier, Richard M., 5,151,519, Cl. 546-219.000.

Gaeng, Manfred; Saukel, Heinz; Hoffmann, Wolfgang; and Koenig, Josef, to BASF Aktiengesellschaft. Preparation of 2-methylbenzoxazole. 5,151,523, Cl. 548-217.000.

Gagne, William R.: *See*—
Silvenis, Scott A.; Monaghan, Paul B.; Massucco, Arthur A.; Spencer, Richard H.; and Gagne, William R., 5,150,841, Cl. 239-332.000.

Gaide, Pierre, to Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle. System for aligning the inertial unit of a carried vehicle on that of a carrier vehicle. 5,150,856, Cl. 244-3.200.

Gaidry, John E.; Quebedeaux, Larry J.; Donovan, Joseph F.; and Ashton, Jefferson P., to Baker Hughes Incorporated. Gravel pack screen having retention mesh support and fluid permeable particulate solids. 5,150,753, Cl. 166-278.000.

Gallagher, Paul H. Ball point pen with liquid ink. 5,150,979, Cl. 401-209.000.

Gallaher Ltd.: *See*—
Cunningham, Linda J.; Adams, Brian; and Barham, William, 5,150,725, Cl. 131-365.000.

Galyon, George T.; Jordhamo, George M.; and Wirtz, Louis H., to International Business Machines Corp. Continuous anodizing of a cylindrical aluminum surface. 5,151,169, Cl. 205-151.000.

Games Workshop Limited: *See*—
Thornthwaite, John B.; and Naismith, Robert, 5,151,232, Cl. 264-130.000.

Gans, David L. Bag grip. 5,150,938, Cl. 294-156.000.

Garcia, Georges; Di Malta, Alain; and Soubrie, Philippe, to Sanofi. Chroman derivative active on the central nervous system, their method of preparation and pharmaceutical compositions in which they are present. 5,151,442, Cl. 514-456.000.

Garcia, Susan J., to Cray Research, Inc. Method and apparatus for producing successive calculated results in a high-speed computer functional unit using low-speed VLSI components. 5,151,995, Cl. 395-800.000.

Gardner, Hugh C.: *See*—
Qureshi, Shahid P.; and Gardner, Hugh C., 5,151,471, Cl. 525-423.000.

Gaude, Robert: *See—*
Farrow, Robert I.; DeMint, Paul; Johnson, Drey; Gaude, Robert; and McNeill, Ray O., 5,150,849, Cl. 242-56.00R.
GE Plastics Japan, Ltd.: *See—*
Sakashita, Takeshi; and Shimoda, Tomoaki, 5,151,491, Cl. 528-199.000.
Geberit AG: *See—*
Egli, Anton, 5,150,926, Cl. 285-110.000.
Schmucki, Peter, 5,150,480, Cl. 4-252.300.
GEC Alsthom SA: *See—*
Perret, Michel, 5,151,565, Cl. 200-148.00A.
Thuries, Edmond, 5,151,567, Cl. 200-148.00F.
Vincent de Paul, Michel; and Detanne, Francois, 5,150,736, Cl. 137-625.300.
GEC Ferranti Defence Systems Limited: *See—*
Sillitto, Hilary G.; and Lessels, Alison B., 5,151,820, Cl. 359-354.000.
Gelin, Benoit; and Lebourg, Michel, to U.S. Philips Corp. Coherent demodulation method for a digitally modulated signal having a continuous phase and a constant envelope. 5,151,925, Cl. 375-82.000.
Gelman Sciences, Inc.: *See—*
Hu, Ho-Pin; Katsnelson, Inessa; and Sellinger, Alan, 5,151,189, Cl. 210-635.000.
Genencor International, Inc.: *See—*
Heinsohn, Henry G.; Lorch, Jeffrey D.; Hayenga, Kirk J.; and Arnold, Raymond E., 5,151,358, Cl. 435-226.000.
Genentech, Inc.: *See—*
Hwang-Felgner, Jiin-Yu; Jones, Richard E.; and Maher, James F., 5,151,265, Cl. 424-85.500.
General Atomics: *See—*
Stephens, Richard B., 5,151,819, Cl. 359-350.000.
General Dynamics Corporation, Convair Division: *See—*
Valia, David A., 5,151,472, Cl. 525-432.000.
General Electric Company: *See—*
Austin, Curtiss M.; Darolia, Ramgopal; O'Hara, Kevin S.; and Ross, Earl W., 5,151,249, Cl. 420-445.000.
Chennakeshu, Sandeep; and Saulnier, Gary J., 5,151,926, Cl. 375-84.000.
DeBiasi, Mark S.; and Menelly, Richard A., 5,151,842, Cl. 361-93.000.
Engeler, William E., 5,151,970, Cl. 395-24.000.
Farrall, George A.; Cocoma, John P.; Dakin, James T.; Duffy, Mark E.; and Berry, Tommie, Jr., 5,151,633, Cl. 315-248.000.
Farrell, William M., 5,150,567, Cl. 60-39.020.
Gubanc, David M.; Liston, Larry J.; and Zimmerman, Jeffrey M., 5,151,258, Cl. 423-235.000.
Immorlica, Anthony A., Jr.; and Chase, Robert F., 5,151,769, Cl. 357-53.000.
Jaster, Heinz; and Bessler, Warren F., 5,150,583, Cl. 62-179.000.
Law, Robert J.; Robles, Michel N.; and Snyder, Dane T., 5,151,244, Cl. 376-245.000.
Maher, David L.; Rodriquez, Callista M.; and Trahan, Paul A., 5,151,556, Cl. 89-35.010.
Maier, Joseph K.; Vavrek, Robert M.; and Glover, Gary H., 5,151,656, Cl. 324-309.000.
Reedy, David V., 5,150,839, Cl. 239-265.410.
Urkowitz, Harry, 5,151,702, Cl. 342-134.000.
Wojnarowski, Robert J.; and Eichelberger, Charles W., 5,151,776, Cl. 357-81.000.
Yates, John B., III; Pratt, Charles F.; and McHale, Angelika H., 5,151,460, Cl. 524-291.000.
General Instrument Corporation: *See—*
Griffin, Roy A., III; Esserman, James N.; and Anderson, Steven E., 5,151,938, Cl. 380-43.000.
Huber, David R., 5,151,908, Cl. 372-6.000.
Sedigh, Mohammad; Shyr, Richard; Shih, Edward; and Mitchell, Muni, 5,151,846, Cl. 361-306.000.
General Mills, Inc.: *See—*
Foehse, Karen B.; Efstathiou, John D.; and Stoll, James R., 5,151,283, Cl. 426-93.000.
General Motors Corporation: *See—*
Brevick, John E.; Bittner, Steven P.; and Kling, Briant J., 5,150,676, Cl. 123-195.00R.
Charles, Harlan W.; and Miller, Larry D., 5,150,775, Cl. 188-299.000.
Currie, James H.; Peden, Richard A.; Sczomak, David P.; Mitchell, Mark A.; and Brown, Michael J., 5,150,694, Cl. 123-569.000.
Hamberg, James P.; Baldini, Todd H.; Smith, Stanley E.; Collins, Wendell, Jr.; and Longhouse, Richard E., 5,150,886, Cl. 267-220.000.
Hickey, Gregory M.; Green, Norbert J., Jr.; and Kozak, Michael J., 5,150,773, Cl. 188-79.550.
Hoptry, David A.; Petrofes, James M.; Shal, David A.; and Denton, Gary R., 5,150,915, Cl. 280-707.000.
Hunt, Terry J.; and Breda, Michael A., 5,150,596, Cl. 72-186.000.
Kabasin, Daniel F.; and Stoltman, Donald D., 5,150,696, Cl. 123-571.000.
Morris, Robert L.; and Bartos, Andrew L., 5,150,629, Cl. 74-337.500.
Myslicki, Robert J.; Khalid, Hecham R.; and Aubry, Michael E., 5,150,933, Cl. 292-216.000.
Nagengast, William E.; and Filosa, Philip C., 5,151,849, Cl. 362-61.000.
Parker, Donald L., 5,150,575, Cl. 60-547.100.
Petrofes, James M.; Shal, David A.; Denton, Gary R.; and Hoptry, David A., 5,150,916, Cl. 280-707.000.
Redick, Morris R., 5,150,960, Cl. 362-83.200.
Rush, William B., II; Elder, Jack E.; and Shier, Richard K., 5,150,669, Cl. 123-52.0MF.
Simin, Gerald L., 5,150,939, Cl. 296-37.100.
Tomasov, Glenn E.; and Schmidt, Annette M., 5,150,584, Cl. 62-209.000.
Trombley, Douglass E.; Stiles, Steven D.; Buslepp, Kenneth J.; and Buslepp, Kenneth J., 5,150,692, Cl. 123-533.000.
Troxell, John R., 5,151,632, Cl. 315-169.100.
General Motors France: *See—*
Pantale, David; and Schonenberger, Eric, 5,150,772, Cl. 188-72.400.
Valmir, Francis; Mazon, Yves; and Schonenberger, Eric, 5,151,681, Cl. 340-454.000.
Georgia Tech Research Corporation: *See—*
Roglin, Robert L.; and Hanagud, Sathyanaraya, 5,150,864, Cl. 244-219.000.
Geraghty, Rod; and Burgess, Robert D., to Geraghty, Rod. Pellet stove feeder. 5,151,000, Cl. 414-187.000.
Gernet, Pierre; Steinemann, Werner; and Margot, Paul-Andre, to Oerlikon-Contraves AG. Rapid orientation apparatus for an observation and/or weapon-carrying vehicle. 5,151,677, Cl. 338-99.000.
Gerrick, R. Andrew: *See—*
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, 5,150,748, Cl. 165-41.000.
Gerstung, Ulrich: *See—*
Kull, Hermann; Berger, Joachim; Gerstung, Ulrich; and Bleuel, Klaus, 5,150,681, Cl. 123-399.000.
Geusz, Steven D.; and Anderson, David M., to ChemGen Corporation. Process of using bacteria that metabolize phenylacetate through mandelate. 5,151,353, Cl. 435-147.000.
Gewald, Harold W.: *See—*
Sadler, William G., 5,150,670, Cl. 123-55.00R.
Giammona, Larry: *See—*
Perilloux, Bruce; Bloom, Arnold; Fischer, Dennis; Giammona, Larry; and Johnston, Thomas F., 5,151,917, Cl. 372-102.000.
Gibler, Carma J.: *See—*
Stevens, Craig A.; Gibler, Carma J.; Chamberlain, Linda R.; and Brownscombe, Thomas F., 5,151,475, Cl. 526-83.000.
Gibson, James H.: *See—*
Cone, Dennis E.; and Gibson, James H., 5,151,072, Cl. 482-104.000.
Gibson, Timothy S.: *See—*
Krzywicki, Stanley J.; Gibson, Timothy S.; and Orndorff, Joseph D., 5,151,654, Cl. 324-160.000.
Giersch, Wolfgang K.; Blanc, Pierre-Alain; and Schulte-Elte, Karl-Heinrich, to Firmenich S.A. Use of a spiranic compound as a perfuming ingredient. 5,151,410, Cl. 512-9.000.
Gilb, Tyrell T., to Simpson Strong-Tie Company, Inc. Deck post tie. 5,150,982, Cl. 403-232.100.
Gill, Manzur; and McElroy, David J., to Texas Instruments Incorporated. Integrated circuit with improved capacitive coupling. 5,151,760, Cl. 357-23.500.
Gilton, Terry L.; Tuttle, Mark E.; and Cathey, David A, to Micron Technology, Inc. Process for metallizing integrated circuits with electrolytically-deposited copper. 5,151,168, Cl. 205-123.000.
Giordano, Edward C.; O'Brien, Mark; Petrucci, Raymond M.; and Taylor, Bruce G., to Cuno, Incorporated. Radial and axial flow stage filter device. 5,151,180, Cl. 210-264.000.
Giust, Henri; and Cippelletti, Ennio, to Somfy. Universal device for winding cords, cables and suchlike. 5,150,846, Cl. 242-54.00R.
Givaudan Corporation: *See—*
Frater, Georg; and Helmlinger, Daniel, 5,151,411, Cl. 512-15.000.
GKN Automotive AG: *See—*
Muller, Karl-Heinz, 5,150,503, Cl. 24-20.0EE.
Glace, William R.: *See—*
Ibsen, Robert L.; Pacropis, Donald R.; and Glace, William R., 5,151,453, Cl. 522-14.000.
Glance, Patrick M.; and Glance, Paul, to Concept Analysis Corp. Elastomeric energy absorbing mechanism for vehicle bumpers. 5,150,935, Cl. 293-136.000.
Glance, Paul: *See—*
Glance, Patrick M.; and Glance, Paul, 5,150,935, Cl. 293-136.000.
Glaser, R. Steven; and Bade, Jeffrey M., to Dow Chemical Company, The. High speed power analyzer. 5,151,866, Cl. 364-483.000.
Glatzl, Frank J.: *See—*
Carpenter, James B.; Doss, Donald G.; and Glatzl, Frank J., 5,151,964, Cl. 385-98.000.
Glaug, Frank S.; and Mattingly, William B., III, to McNeil-PPC, Inc. Absorbent structure having multiple canals. 5,151,091, Cl. 604-385.100.
Glomski, Norman J., to Heil Co., The. Refuse container with two-position lid. 5,150,806, Cl. 220-331.000.
Glover, Gary: *See—*
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, 5,150,748, Cl. 165-41.000.
Glover, Gary H.: *See—*
Maier, Joseph K.; Vavrek, Robert M.; and Glover, Gary H., 5,151,656, Cl. 324-309.000.
Glover, Richard J.: *See—*
Hvezda, Jaroslav M.; Fisher, Robert W.; Olszewski, Edward J.; Morrin, Hugh F. C.; and Glover, Richard J., 5,151,961, Cl. 385-60.000.
Gluchowski, Charles, to Allergan, Inc. Method for reducing or maintaining intraocular pressure in the mammalian eye by administering pharmaceutical compositions containing 2-(2-alkylphenylamino)-

oxazolines, 2-(2-alkylphenyl-amino)-thiazolines and 2-(2-alkylphenylamino)-imidazolines. 5,151,440, Cl. 514-377.000.
Gmuer, Bruno, to Buehler AG. Rotary receptacle scale. 5,150,758, Cl. 177-84.000.
Go Corporation: *See*—
Hullender, Gregory N., 5,151,950, Cl. 382-13.000.
Goble, George H. Drop-in substitute for dichlorodifluoromethane refrigerant. 5,151,207, Cl. 252-67.000.
Goela, Jitendra S.; Pickering, Michael; and Taylor, Raymond L., to CVD Incorporated. Method of fabricating lightweight honeycomb structures. 5,150,507, Cl. 29-460.000.
Goetz, Norbert: *See*—
Hermeling, Dieter; Degner, Dieter; Harreus, Albrecht; Goetz, Norbert; Wild, Jochen; Theobald, Hans; and Wolf, Bernd, 5,151,548, Cl. 560-255.000.
Gold, Peter. Vehicle window and method of installing same. 5,150,943, Cl. 296-201.000.
Gold, Peter N. Moisture-activated adhesive-backed tape. 5,151,328, Cl. 428-351.000.
Goldberg, Jack; and Rosati, Robert J., to IVAC Corporation. System and method for temperature determination and calibration in a biomedical probe. 5,150,969, Cl. 374-128.000.
Golden Key Futura, Inc.: *See*—
Troncoso, Vincent F., 5,150,700, Cl. 124-44.500.
Goldsmith, Riley G.: *See*—
White, Charles N.; and Goldsmith, Riley G., 5,150,987, Cl. 405-224.000.
Gomi, Hiroshi: *See*—
Yoshino, Ryutaro; Gomi, Hiroshi; Nishikawa, Masao; and Hirose, Masato, 5,151,859, Cl. 364-424.020.
Gomi, Katsuhige: *See*—
Nakano, Hirofumi; Kawada, Shozo; Uosaki, Yoichi; Saito, Yutaka; Gomi, Katsuhige; and Iwazaki, Toshiaki, 5,151,352, Cl. 435-123.000.
Gonzalez, Jaime D. Apparatus for illuminating a vehicle license plate and method of using same. 5,150,961, Cl. 362-83.200.
Goodman, Harold: *See*—
Benveniste, Edgar R.; Tarlow, Kenneth A.; Goodman, Harold; and Benveniste, Gloria H., 5,150,953, Cl. 312-9.580.
Goodman, Sperry H.: *See*—
Badger, Scott L.; Braun, John P.; and Goodman, Sperry H., 5,151,705, Cl. 342-368.000.
Goodrich, Lewis R., Sr.: *See*—
Holloway, Sidney E., III; Crossley, Edward A., Jr.; Jones, Irby W.; Miller, James B.; Davis, C. Calvin; Behun, Vaughn D.; and Goodrich, Lewis R., Sr., 5,150,875, Cl. 248-550.000.
Goodwin, Todd W.: *See*—
Long, Charles A., Jr.; and Goodwin, Todd W., 5,150,989, Cl. 405-303.000.
Goodyear Tire & Rubber Company, The: *See*—
Hsu, Wen-Liang; and Halasa, Adel F., 5,151,398, Cl. 502-117.000.
Lindsay, Robert B.; and Parrish, Gary C., 5,151,148, Cl. 156-351.000.
Lunieski, Chester E.; and Rye, Grover W., 5,151,141, Cl. 152-544.000.
Marshall, Richard A.; Hershberger, James W.; and Hershberger, Susan A., 5,151,476, Cl. 526-93.000.
Gordon, Jeffrey I.: *See*—
Welply, Joseph K.; Adams, Steven P.; and Gordon, Jeffrey I., 5,151,445, Cl. 514-557.000.
Gordon, Robert T.: *See*—
Leslie, Samuel A.; and Gordon, Robert T., 5,152,002, Cl. 455-11.100.
Goren, David: *See*—
Metlitsky, Boris; Swartz, Jerome; Barkan, Edward; Shepard, Howard; Goren, David; and Biuso, Tony, 5,151,580, Cl. 235-462.000.
Gorsuch, Reynolds G. F.; and Atkin, John, to Heathdyne, Inc. Apparatus and method for kidney dialysis using plasma in lieu of blood. 5,151,082, Cl. 604-4.000.
Gorza, Roberto, to Nordica S.p.A. Fastening particularly for skis. 5,150,914, Cl. 280-616.000.
Goss, George R.: *See*—
Brooke, David D.; Brophy, Shirley A.; and Goss, George R., 5,151,211, Cl. 252-186.100.
Gosselin, Cynthia A.: *See*—
Robbins, Douglas J.; Gosselin, Cynthia A.; and Myers, Frederick A., 5,151,297, Cl. 427-46.000.
Gotanda, Masakazu: *See*—
Sakurai, Tomohisa; and Gotanda, Masakazu, 5,151,085, Cl. 604-22.000.
Goto, Eiichi; Hioe, Willy; Hosoya, Mutsumi; and Kamikawai, Ryotaro, to Research Development Corporation of Japan; and Ryotaro Kamikawai. Superconducting logic circuit. 5,151,617, Cl. 307-462.000.
Goto, Hiroshi: *See*—
Takemoto, Shinichi; Hasegawa, Hirofumi; Toyoshi, Naoki; Oka, Tateki; Goto, Hiroshi; and Yoshida, Narutaka, 5,151,738, Cl. 355-245.000.
Goto, Hiroyuki, to NEC Corporation. High speed output buffer unit that preliminarily sets the output voltage level. 5,151,621, Cl. 307-475.000.
Goto, Jugo; Kubota, Tsutomu; Kotani, Reiichi; and Miyaji, Masuo, to Takeda Chemical Industries, Ltd. Photocurable adhesive of hydroxy-polyesterurethane acrylate, monomer and polyisocyanate. 5,151,454, Cl. 522-93.000.
Goto, Kenji; Tsukamoto, Manabu; Ishida, Masayuki; and Ishida, Yoshinobu, to Mitsubishi Denki Kabushiki Kaisha. Magnetic recording and reproducing apparatus and method of recording and reproducing. 5,151,830, Cl. 360-32.000.
Gotou, Shizuo: *See*—
Iwasawa, Kyoko; Tanaka, Yoshikazu; and Gotou, Shizuo, 5,151,991, Cl. 395-700.000.
Gotou, Yukifumi, to Kabushiki Kaisha Toshiba. Multiple air conditioning apparatus. 5,150,582, Cl. 62-155.000.
Gottlieb Guhring KG: *See*—
Reinauer, Josef, 5,150,995, Cl. 409-234.000.
Gottschalk, Peter; Neckers, Douglas C.; and Schuster, Gary B., to Mead Corporation, The. Cationic dye-triarylmonoalkylorate anion complexes. 5,151,520, Cl. 548-110.000.
Gould, Murray J.; Kohn, Joshua L.; and Kohn, Matthew O., to Longacre & White. Multi-functional coaster. 5,150,869, Cl. 248-346.100.
Grabbe, Dimitry G.: *See*—
Korsunky, Iosif; and Grabbe, Dimitry G., 5,151,046, Cl. 439-326.000.
Gracyalny, Gary J., to Briggs & Stratton Corporation. Centrifugally responsive compressing release mechanism. 5,150,674, Cl. 123-182.100.
Grallert, Hans-Joachim, to Siemens Aktiengesellschaft. Method and apparatus for quality monitoring of at least two transmission sections of a digital signal transmission link. 5,151,902, Cl. 371-51.000.
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Maginness, Maxwell G., 5,151,579, Cl. 235-375.000.
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Matkovich, Vlado I.; Degen, Peter J.; Gsell, Thomas C.; Bormann, Thomas; and Rothman, Isaac, 5,151,192, Cl. 210-646.000.
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Haagh, Johannes P. N.; van Driest, Hans; and Smit, Gerrit, to NCR Corporation. Radio LAN station with improved frame delimiter detection in a spread spectrum environment. 5,151,920, Cl. 375-1.000.
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Hall, James A. Brush deflector attachment for chain saw. 5,150,524, Cl. 30-382.000.
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Riley, Wendell D.; and Childs, Jerry D., 5,151,203, Cl. 252-8.551.
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Hammerschmitt, Nikolaus. Light-liquid separator. 5,151,185, Cl. 210-521.000.
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Hanamoto, Hiroyuki, to Minolta Camera Kabushiki Kaisha. Copying apparatus that automatically sets manually inputted conditions of immediately preceding interrupt as initial copy condition for present interrupt. 5,152,001, Cl. 395-800.000.
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Hanifl, Paul H., to Sage Products, Inc. Suction swab. 5,151,094, Cl. 604-902.000.
Hanna, John E., to Motorola, Inc. Circuit and method of signal differentiation. 5,151,662, Cl. 328-127.000.
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Hannig, Dieter: *See—*
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Hanoka, Jack I.; and Danielson, Scott E., to Mobil Solar Energy Corporation. Method for forming contacts. 5,151,377, Cl. 437-2.000.
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Harada, Yooichi: *See*—
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Harasin, Stephen J.; Sounik, David F.; and Kelly, Timothy J., to Miles Inc. Process for the production of reinforced polyurethane moldings by the reaction injection molding process. 5,151,483, Cl. 528-44.000.

Hardaway, Anthony H.: *See*—
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Harder, John W.: *See*—
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Harmei, Roman J.: *See*—
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Harral, Michael W.; and Rendell, Eric L., to Normalair-Garrett (Holdings) Limited. Oxygen monitoring method and apparatus. 5,151,166, Cl. 204-425.000.

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Harris Corporation: *See*—
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Harris, James E.: *See*—
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Harris, William J.; and Hwang, Wen-Fang, to Dow Chemical Company, The. Copolymers containing polybenzoxazole, polybenzothiazole and polybenzimidazole moieties. 5,151,489, Cl. 528-183.000.

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Hartness International, Inc.: *See*—
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Hartness, Robert G., to Hartness International, Inc. Square and/or round container packing device. 5,150,563, Cl. 53-539.000.

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Haruyama, Hideyuki: *See*—
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Hasebe, Kazunori, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials. 5,151,345, Cl. 430-525.000.

Hasegawa, Akira: *See*—
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Hasegawa, Susumi; Mizoshita, Yoshifumi; and Takaishi, Kazuhiko, to Fujitsu Limited. System for positioning a transducer. 5,151,639, Cl. 318-568.180.

Hasegawa, Toshiaki: *See*—
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Hashimoto, Atsushi: *See*—
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Hashimoto, Kunio, to Kabushiki Kaisha Nihon Pipe Conveyor Kenkyusho. Tubular belt conveyor. 5,150,783, Cl. 198-819.000.

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Hashimoto, Takeshi, to Clarion Co., Ltd. Spread spectrum communication device. 5,151,921, Cl. 375-1.000.

Hassanzadeh, Hedayat H., to Davis-Lynch, Inc. Well completion apparatus. 5,150,756, Cl. 166-318.000.

Hata, Tadashi: *See*—
Sato, Aiya; Sugano, Michihiro; Furuya, Kouhei; Oshima, Takeshi; Kuwano, Harumitsu; Hata, Tadashi; and Haruyama, Hideyuki, 5,151,529, Cl. 549-354.000.

Hatakeyama, Kazuya: *See*—
Nakajima, Ichiro; Hatakeyama, Kazuya; and Hirata, Yasushi, 5,151,468, Cl. 525-332.700.

Hatano, Mutsuko: *See*—
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Hatchett, Michael R.; Hearn, Anthony R.; and Lacey, Charles M., to International Business Machines Corporation. Method of assembling a disk file. 5,150,512, Cl. 29-603.000.

Haubennestel, Karl-Heinz; and Pritschins, Wolfgang, to BYK-Chemie GmbH. Phosphoric acid esters, method of producing them, and use thereof as dispersants. 5,151,218, Cl. 252-351.000.

Haworth, Inc.: *See*—
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Hayafune, Koji; Naemura, Shinichi; Yasumoto, Hiroshige; and Amemiya, Hideo, to Mitsui Toatsu Chemicals, Inc. Resin compositions including ceramics emitting far infrared rays. 5,151,463, Cl. 524-430.000.

Hayakawa, Atsuya: *See*—
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Hayashi, Nobuharu; and Tanaka, Hiroji, to Sumitomo Rubber Industries, Ltd.; and Penta-Ocean Construction Co., Ltd. Mooring apparatus. 5,150,744, Cl. 114-230.000.

Hayashi, Noriki: *See*—
Sawada, Kazuo; Okura, Kengo; Yoshida, Noriyuki; Takano, Satoshi; Miyazaki, Kenji; and Hayashi, Noriki, 5,151,406, Cl. 505-1.000.

Hayashi, Takashi, to Matsushita Electric Industrial Co., Ltd. Key telephone apparatus. 5,151,934, Cl. 379-159.000.

Hayashi, Teruyuki; Kobayashi, Toshiaki; and Tanaka, Masato, to Agency of Industrial Science and Technology. Organosilicon compound and process for producing organosilicon compound. 5,151,538, Cl. 556-431.000.

Hayashi, Torahiko, to Rheon Automatic Machinery Co., Ltd. Apparatus for stretching dough. 5,151,024, Cl. 425-141.000.

Hayenga, Kirk J.: *See*—
Heinsohn, Henry G.; Lorch, Jeffrey D.; Hayenga, Kirk J.; and Arnold, Raymond E., 5,151,358, Cl. 435-226.000.

Hazeltine Corporation: *See*—
De Clerck, Charles E., 5,151,332, Cl. 428-650.000.
Kumpfbeck, Richard J.; and Hannan, Peter W., 5,151,707, Cl. 343-705.000.

Hearn, Anthony R.: *See*—
Hatchett, Michael R.; Hearn, Anthony R.; and Lacey, Charles M., 5,150,512, Cl. 29-603.000.

Heathdyne, Inc.: *See*—
Gorsuch, Reynolds G. F.; and Atkin, John, 5,151,082, Cl. 604-4.000.
Hediger, Edwin A., to Eastman Kodak Company. Development apparatus and improved auger device for use therein. 5,151,739, Cl. 355-245.000.
Hegland, Frederick P.: *See*—
Svyatsky, Eduard M.; Paroubek, George; and Hegland, Frederick P., 5,150,891, Cl. 271-35.000.
Heil Co., The: *See*—
Glomski, Norman J., 5,150,806, Cl. 220-331.000.
Hein, Richard A., to Hoover Universal, Inc. Self adjusting eccentric pivot mechanism. 5,150,632, Cl. 74-530.000.
Heinola, Kalevi E.: *See*—
Backstrom, Reijo J.; Heinola, Kalevi E.; Nore, Pentti T.; Pystynen, Jarmo J.; Honkanen, Erkki J.; and Haikala, Heimo O., 5,151,420, Cl. 514-247.000.
Heinrich Kopp GmbH & Co. KG: *See*—
Flohr, Peter, 5,151,674, Cl. 335-16.000.
Heinsohn, Henry G.; Lorch, Jeffrey D.; Hayenga, Kirk J.; and Arnold, Raymond E., to Genencor International, Inc. Processes for the recovery of naturally produced chymosin. 5,151,358, Cl. 435-226.000.
Heinz, Hans-Detlef; Pielartzik, Harald; Reinking, Klaus; Meyer, Rolf-Volker; and Korte, Siegfried, to Bayer Aktiengesellschaft. Highly fluid polyarylene sulphide moulding compounds. 5,151,458, Cl. 524-190.000.
Heisler, Doyle J. Golfer weight distribution measurement system. 5,150,902, Cl. 273-186.100.
Heitzmann, David E., to MOR/ryde International, Inc. Trailing arm suspension for vehicle. 5,150,918, Cl. 280-716.000.
Hejhal, Thomas J.: *See*—
Statham, Denise N.; Stanhope, Michael T.; and Hejhal, Thomas J., 5,150,476, Cl. 2-93.000.
Hekker, Roeland M. T.; Livny, Izhak M.; and Mercurio, Gregory S., to Du Pont de Nemours, E. I., and Company. Transform digital/optical processing system including wedge/ring accumulator. 5,151,822, Cl. 359-559.000.
Held, Wolfgang. Detachable cap for a bottle neck. 5,150,801, Cl. 215-11.600.
Helfer, Jeffrey L.: *See*—
Devaney, Mark J., Jr.; Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribhajan S.; and Wagner, Paul W., 5,150,955, Cl. 354-321.000.
Helmlinger, Daniel: *See*—
Frater, Georg; and Helmlinger, Daniel, 5,151,411, Cl. 512-15.000.
Hemco Industries Pty. Ltd.: *See*—
Hemphill, Desmond J., 5,150,487, Cl. 5-625.000.
Hemox, Inc.: *See*—
Simpson, James L., 5,151,074, Cl. 493-133.000.
Hemphill, Desmond J., to Hemco Industries Pty. Ltd. Evacuation restraint. 5,150,487, Cl. 5-625.000.
Hendry, Donald H.; Johnson, Bruce K.; Krawczyk, Joanne M.; and Vierstra, Bruce C., to Polaroid Corporation. 6-bar erecting system. 5,151,728, Cl. 354-83.000.
Henrick, Clive A., to Sandoz Ltd. Method of controlling termites. 5,151,443, Cl. 514-486.000.
Hensby, Christopher: *See*—
Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; and Colin, Michel, 5,151,534, Cl. 554-88.000.
Henshaw, William F.: *See*—
Provenzano, Virgil; Singh, Anand K.; Imam, M. A.; Sadananda, Kuntimadi; and Henshaw, William F., 5,151,407, Cl. 505-1.000.
Her, Tser W. Liquid pump responsive to temperature. 5,151,016, Cl. 417-32.000.
Herbst, Joseph A.: *See*—
Chitnis, Girish K.; and Herbst, Joseph A., 5,151,394, Cl. 502-65.000.
Hergenrother, William L.; and Doshak, John M., to Bridgestone Corporation. Method of preparing elastomers having reduced hysteresis properties with sulfoxides. 5,151,469, Cl. 525-354.000.
Hermeling, Dieter; Degner, Dieter; Harreus, Albrecht; Goetz, Norbert; Wild, Jochen; Theobald, Hans; and Wolf, Bernd, to BASF Aktiengesellschaft. Benzyl alcohols and their lower alkanecarboxylic acid esters. 5,151,548, Cl. 560-255.000.
Hernandez, Raymond: *See*—
Burton, Anthony R.; Mitchell, Monte K.; and Hernandez, Raymond, 5,150,751, Cl. 166-81.000.
Herndon, James F.; and Morgan, Dennis J., to Hoover Treated Wood Products, Inc. Flame retardant composition and method for treating wood. 5,151,225, Cl. 252-607.000.
Heroux, Paul. Pair of electrically shielded triaxial magnetic sensors for determination of electric currents in conductors in air with distance and angle compensation. 5,151,649, Cl. 324-127.000.
Hershberger, James W.: *See*—
Marshall, Richard A.; Hershberger, James W.; and Hershberger, Susan A., 5,151,476, Cl. 526-93.000.
Hershberger, Susan A.: *See*—
Marshall, Richard A.; Hershberger, James W.; and Hershberger, Susan A., 5,151,476, Cl. 526-93.000.
Herve, Yolande: *See*—
Vincent, Michel; Remond, Georges; Portevin, Bernard; Herve, Yolande; and Lepagnol, Jean, 5,151,432, Cl. 514-299.000.
Herzig, Christian, to Wacker-Chemie GmbH. Organopolysiloxanes containing sulfosuccinate groups. 5,151,473, Cl. 525-474.000.
Herzog, Claus, to MTU Motoren- Und Turbinen-Union Munchen GmbH. Device for exposing or shutting off a turbo-engine on the intake air side of the engine. 5,150,571, Cl. 60-200.100.
Hettinga, Siebolt. Method of injection molding a flat deformable laminate. 5,151,237, Cl. 264-257.000.
Hewlett-Packard Company: *See*—
Nickerson, Mark A.; Poole, John S.; and Frank, Lenore G. R., 5,151,178, Cl. 210-198.200.
Quimby, Bruce D.; and Sullivan, James J., 5,151,371, Cl. 436-127.000.
Ward, Jefferson P.; Harmon, J. P.; English, Kris M.; and Christensen, Kenneth L., 5,151,715, Cl. 346-140.00R.
Wille, Ross M.; and Carter, Richard J., 5,151,994, Cl. 395-800.000.
You, Young S.; and Meyer, John D., 5,151,120, Cl. 106-27.000.
Hickey, Gregory M.; Green, Norbert J., Jr.; and Kozak, Michael J., to General Motors Corporation. Electrically actuated electric brake with wear compensating adjuster. 5,150,773, Cl. 188-79.550.
Hickey, John C., to Ford Motor Company. Molded fuel injector and method for producing. 5,150,842, Cl. 239-585.400.
Hiei, Masaichi: *See*—
Tatebayashi, Tsuneo; Uno, Yoshio; and Hiei, Masaichi, 5,150,704, Cl. 128-395.000.
Higby, Jeffrey P., to Outboard Marine Corporation. Shiftable reversing transmission for marine propulsion device. 5,151,059, Cl. 440-75.000.
Hihlein, Peter: *See*—
Schmalstieg, Lutz; Hihlein, Peter; Pedain, Josef; and Wieczorrek, Wolfhart, 5,151,484, Cl. 528-45.000.
Hilkenmeier, Jurgen; and Volke, Hans-Werner, to Siemens-Nixdorf Informationssysteme AG. Matrix printing head with forward and return articulated-armature magnets. 5,150,976, Cl. 400-124.000.
Hill, Brian T.: *See*—
Bronikowski, Joseph T.; Hill, Brian T.; Sackmann, David J.; and Weber, Mark S., 5,151,978, Cl. 395-200.000.
Hill, Shirley J. Christmas tree light receptacle apparatus. 5,150,963, Cl. 362-123.000.
Hill, Thomas E., to Loudon Enterprises, Inc. Rock drill bit and method of making same. 5,150,636, Cl. 76-108.200.
Hillgartner, Klaus, to Dr. Ing. h.c.F. Porsche AG. Shifting arrangement for a motor vehicle transmission. 5,150,633, Cl. 74-475.000.
Hillis, Daniel W., to Thinking Machines Corporation. Array communications arrangement for parallel processor. 5,152,000, Cl. 395-800.000.
Hillis, W. Daniel, to Thinking Machines Corporation. Multi-dimensional message transfer router. 5,151,996, Cl. 395-800.000.
Hingst, Uwe, to Bodenseewerk Geratetechnik GmbH. Two stage cooler for cooling an object. 5,150,579, Cl. 62-51.200.
Hioe, Willy: *See*—
Goto, Eiichi; Hioe, Willy; Hosoya, Mutsumi; and Kamikawai, Ryotaro, 5,151,617, Cl. 307-462.000.
Hirahara, Kazuaki, to Omron Tateisi Electronics Co. Boarding gate seat checkin apparatus and method. 5,151,692, Cl. 340-825.280.
Hirahata, Shinichi: *See*—
Sato, Shougo; Ohashi, Tsuyoshi; and Hirahata, Shinichi, 5,151,586, Cl. 250-205.000.
Hirakawa, Tadao; Tamura, Sachio; and Sasanami, Hiromitsu. to Kabushiki Kaisha Goto Seisakusho. Method for producing a package-type semiconductor assembly. 5,151,118, Cl. 65-18.100.
Hirano, Ryoichi: *See*—
Ishibashi, Yoriyuki; Hirano, Ryoichi; and Nishida, Jun, 5,151,754, Cl. 356-356.000.
Hirano, Tsumoru: *See*—
Sakanoue, Kei; and Hirano, Tsumoru, 5,151,356, Cl. 430-548.000.
Hirao, Akihiko; Sawada, Tomoyuki; Takayama, Shinji; Aoyama, Youichi; Matsuoka, Yukihiro; and Hiroshima, Tatsuo, to Matsushita Electric Works, Ltd. Circuit breaker. 5,151,671, Cl. 335-172.000.
Hirao, Yutaka: *See*—
Kameyama, Shoju; Miyano, Kenmi; Hashimoto, Motonori; Takechi, Kazuo; Ohmura, Takao; Hirao, Yutaka; Uemura, Yahiro; and Yokoyama, Kazumasa, 5,151,499, Cl. 530-381.000.
Hirashima, Isao: *See*—
Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiro; Hirashima, Isao; and Ushijima, Kazuhiro, 5,150,919, Cl. 280-732.000.
Hirata, Toichi; Tanaka, Hideaki; Sugiyama, Genroku; and Kajita, Yusuke, to Hitachi Construction Machinery Co., Ltd. Hydraulic drive system for civil engineering and construction machine. 5,150,574, Cl. 60-465.000.
Hirata, Yasushi: *See*—
Nakajima, Ichiro; Hatakeyama, Kazuya; and Hirata, Yasushi, 5,151,468, Cl. 525-332.700.
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, to Hitachi, Ltd. Superconducting composition comprising Ln-Th-Cu-O, wherein Ln is Pr, Nd, Pm, Sm, Eu, Gd, Er or mixtures thereof. 5,151,409, Cl. 505-1.000.
Hirobe, Toshihiko: *See*—
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000.
Hiroi, Atsushi; Kondo, Mitsuhiro; and Ohshima, Kinya, to Ibiden Co., Ltd. High lead count circuit board for connecting electronic components to an external circuit. 5,151,771, Cl. 357-70.000.
Hirose Electric Co., Ltd.: *See*—
Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshiro, 5,151,033, Cl. 439-95.000.
Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshihiro, 5,151,035, Cl. 439-95.000.
Sato, Kensaku, 5,151,048, Cl. 439-357.000.

Hirose, Hideo, to Shimadzu Corporation. Method and apparatus for generating X rays. 5,151,928, Cl. 378-119.000.
Hirose, Masato: *See*—
Yoshino, Ryutaro; Gomi, Hiroshi; Nishikawa, Masao; and Hirose, Masato, 5,151,859, Cl. 364-424.020.
Hiroshima, Tatsuo: *See*—
Hirao, Akihiko; Sawada, Tomoyuki; Takayama, Shinji; Aoyama, Youichi; Matsuoka, Yukihiro; and Hiroshima, Tatsuo, 5,151,671, Cl. 335-172.000.
Hiroshima, Yasunori, to Pioneer Electronic Corporation. Liquid crystal display apparatus providing improved illumination via trucated prisms. 5,151,801, Cl. 359-40.000.
Hirschbein, Bernard L.: *See*—
Stec, Wojciech J.; Uznanski, Bogdan; Bergot, B. John; Hirschbein, Bernard L.; and Fearon, Karen L., 5,151,510, Cl. 536-27.000.
Hirsh, John R. Calculator with music generating device. 5,151,873, Cl. 364-710.120.
Hitach Metals, Ltd.: *See*—
Ohya, Hiroshi; and Kato, Takeshi, 5,150,923, Cl. 285-21.000.
Hitachi Computer Engineering Co., Ltd.: *See*—
Nishiyama, Yoshinori; Yanagita, Tomoatsu; Nagai, Masahiko; Morikuni, Mitsuru; and Matsumoto, Kenji, 5,151,868, Cl. 364-490.000.
Hitachi Construction Machinery Co., Ltd.: *See*—
Hirata, Toichi; Tanaka, Hideaki; Sugiyama, Genroku; and Kajita, Yusuke, 5,150,574, Cl. 60-465.000.
Hitachi Koki Co., Ltd.: *See*—
Okada, Kenji; and Ogawa, Tsukasa, 5,150,648, Cl. 101-93.140.
Uno, Kazuo; and Shirakawa, Junji, 5,150,893, Cl. 271-157.000.
Hitachi, Ltd.: *See*—
Fujioka, Toshinori, 5,151,582, Cl. 235-469.000.
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,151,409, Cl. 505-1.000.
Iwasawa, Kyoko; Tanaka, Yoshikazu; and Gotou, Shizuo, 5,151,991, Cl. 395-700.000.
Kabuto, Nobuaki; Igarashi, Mayumi; Inoue, Fumio; and Ando, Kunio, 5,151,689, Cl. 340-784.000.
Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, 5,150,489, Cl. 8-159.000.
Kajigaya, Kazuhiko; and Sawada, Jiro, 5,151,881, Cl. 365-233.000.
Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, 5,151,696, Cl. 341-22.000.
Kawaguchi, Hideo; Takeuchi, Kouji; Ishibashi, Tadashi; Shimizu, Norio; and Odawara, Yoji, 5,151,362, Cl. 435-240.250.
Koyanagi, Osamu; Seki, Yasuharu; and Tsukushi, Masanori, 5,151,366, Cl. 200-110.00A.
Matsui, Kiyoshi; Satoh, Ryohei; Netsu, Toshitada; Sasaki, Hideaki; Shirai, Mitugu; and Hamamura, Kenichi, 5,151,773, Cl. 357-74.000.
Minowa, Toshimichi; and Ohyama, Yoshishige, 5,150,635, Cl. 74-866.000.
Mita, Seiichi; Izumita, Morishi; Ide, Hiroshi; Doi, Nobukazu; Okada, Yoshinori; and Inagaki, Yasuo, 5,151,924, Cl. 375-12.000.
Nakagawa, Yasuo; and Nayer, Shree K., 5,151,609, Cl. 250-561.000.
Nishimura, Yutaka, 5,150,680, Cl. 123-399.000.
Nishiyama, Yoshinori; Yanagita, Tomoatsu; Nagai, Masahiko; Morikuni, Mitsuru; and Matsumoto, Kenji, 5,151,868, Cl. 364-490.000.
Sasaki, Akira; Kato, Takeshi; and Hakoyama, Akiyoshi, 5,151,973, Cl. 395-109.000.
Sekiya, Teruo; Kimura, Tomoaki; and Nishimura, Sadao, 5,150,597, Cl. 72-229.000.
Takada, Kazuaki; Kanari, Masayuki; Yajima, Makoto; and Toyoda, Eiji, 5,151,637, Cl. 318-376.000.
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000.
Tani, Masayuki; Nakanishi, Kunio; Kawabata, Atsushi; Watanabe, Norito; Yokoyama, Takanori; and Tanifuji, Shinya, 5,151,974, Cl. 395-128.000.
Yamagishi, Mamio, 5,151,988, Cl. 395-600.000.
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.
Hitachi Maxell, Ltd.: *See*—
Fujita, Minoru, 5,151,894, Cl. 369-291.000.
Hitachi Metals Ltd.: *See*—
Yoshizawa, Yoshihito; Bizen, Yoshio; Yamauchi, Kiyotaka; Nishiyama, Toshikazu; and Suwabe, Shigekazu, 5,151,137, Cl. 148-313.000.
Hitachi Taga Engineering Co., Ltd.: *See*—
Takada, Kazuaki; Kanari, Masayuki; Yajima, Makoto; and Toyoda, Eiji, 5,151,637, Cl. 318-376.000.
Hitachi Techno Engineering Co., Ltd.: *See*—
Hamamura, Fumio; and Watanabe, Katsuyoshi, 5,150,639, Cl. 83-39.000.
Hitachi VLSI Engineering Corp.: *See*—
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000.
Hitz, Hans; Schaefer, Rolf; Baust, Heinrich; and Gross, Wolfgang, to Chemisches Institut Schaefer AG; and Joh. A. Benckiser GmbH. Process for preparing polycarboxylic acid imidazolines by condensation reaction. 5,151,522, Cl. 548-112.000.
Hivessy, Geza: *See*—
Bergmann, Gyorgy; Hivessy, Geza; Homola, Tamas; Bakay, Arpad; and Horvath, Mihaly, 5,150,749, Cl. 165-115.000.
Hiyama, Isao: *See*—
Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, 5,150,489, Cl. 8-159.000.
Ho, Helena S.: *See*—
Shenoi, Kishan; Hanagan, Patrick L.; Ho, Helena S.; and Yu, Frank I., 5,151,901, Cl. 370-110.100.
Ho, Loan A.: *See*—
Treybig, Duane S.; Wang, David S.; Sheih, Pong S.; and Ho, Loan A., 5,151,485, Cl. 528-87.000.
Hobbs, Frank W., Jr.; and Trainor, George L., to Du Pont de Nemours, E. I., and Company. Alkynylamino-nucleotides. 5,151,507, Cl. 536-23.000.
Hochberg, Joel; Stamper, Timothy D. J.; and Stamper, Christopher T. J., to Rare Coin-It, Inc. Game apparatus. 5,150,898, Cl. 273-85.00C.
Hodel, Walter: *See*—
Bi, Junging; Beaud, Paul A.; Schutz, Jurg A.; Hodel, Walter; and Weber, Heinz P., 5,151,911, Cl. 372-32.000.
Hodogaya Chemical Co., Ltd.: *See*—
Inaba, Hitoshi; Nishijima, Kazumi; Kato, Kazuo; Yamamoto, Ichiro; Mochida, Ei; and Ohtomo, Kikuo, 5,151,431, Cl. 514-292.000.
Hoechst Aktiengesellschaft: *See*—
Arndt, Otto; and Papenfuhs, Theodor, 5,151,532, Cl. 552-308.000.
Bothe, Lothar, 5,151,317, Cl. 428-216.000.
Fulbreth, Werner; Leeb, Richard; Radau, Manfred; and Stammberger, Willi, 5,151,433, Cl. 514-299.000.
Lappe, Peter; and Springer, Helmut, 5,151,537, Cl. 556-136.000.
Wiedemann, Wolfgang, 5,151,342, Cl. 430-271.000.
Hoechst Celanese Corporation: *See*—
Adams, Peter M., 5,150,812, Cl. 220-414.000.
Aslam, Mohammad; and Davenport, Kenneth G., 5,151,540, Cl. 558-232.000.
Munday, Jerry T.; and Meiss, Theodore D., 5,151,494, Cl. 528-287.000.
Shah, Bakulesh N.; Tran, Dung Q.; and Keene, Donna L., 5,151,546, Cl. 560-130.000.
Zey, Edward G.; Shockley, Thomas H.; Ryan, Debra A.; and Moss, Gary L., 5,151,551, Cl. 562-494.000.
Hoeks, Frans; and Venetz, Daniel, to Lonza Ltd. Process for the production of 6-hydroxynicotinic acid. 5,151,351, Cl. 435-122.000.
Hoeksema, Scot D.: *See*—
Delente, Jacques J.; Behrens, Paul W.; and Hoeksema, Scot D., 5,151,347, Cl. 435-3.000.
Hoelzl, Klaus, to TMC Corporation. Finger operated button activating wireless transmission path for effecting voluntary release of a ski binding. 5,150,913, Cl. 280-612.000.
Hoff, Don G., to Seiko Corporation; and Seiko Epson Corp. Pager watch system utilizing time slot communication. 5,150,954, Cl. 340-825.440.
Hoffend, Thomas R.: *See*—
Bayley, Robert D.; and Hoffend, Thomas R., 5,151,338, Cl. 430-106.000.
Hoffmann, Jurgen: *See*—
Maier, Dieter; Egner, Harald; Frohlich, Stefan; and Hoffmann, Jurgen, 5,151,241, Cl. 264-314.000.
Hoffmann, Wolfgang: *See*—
Gaeng, Manfred; Saukel, Heinz; Hoffmann, Wolfgang; and Koenig, Josef, 5,151,523, Cl. 548-217.000.
Hofmeister, Peter: *See*—
Mueller, Stefan; Theobald, Hans; Wolf, Bernd; Hofmeister, Peter; Kardorff, Uwe; and Kuenast, Christoph, 5,151,441, Cl. 514-378.000.
Holland, Kurt: *See*—
Elias, Samir F.; Klausmeyer, Kevin; and Holland, Kurt, 5,151,456, Cl. 524-60.000.
Holle, Norbert: *See*—
Frank, Wolfgang; Loffler, Johannes; and Holle, Norbert, 5,150,729, Cl. 137-340.000.
Hollenberg, Cornelius: *See*—
Strasser, Alexander; Martens, Feodor B.; Dohmen, Jurgen; and Hollenberg, Cornelius P., 5,151,354, Cl. 435-161.000.
Hollenberg, Cornelius P.: *See*—
Strasser, Alexander; Martens, Feodor B.; Dohmen, Jurgen; and Hollenberg, Cornelius P., 5,151,354, Cl. 435-161.000.
Holloway, Sidney E., III; Crossley, Edward A., Jr.; Jones, Irby W.; Miller, James B.; Davis, C. Calvin; Behun, Vaughn D.; and Goodrich, Lewis R., Sr., to United States of America, National Aeronautics and Space Administration. Linear mass actuator. 5,150,875, Cl. 248-550.000.
Holmes, David. Game racket with incurvate contact surfaces. 5,150,896, Cl. 273-67.00R.
Homola, Tamas: *See*—
Bergmann, Gyorgy; Hivessy, Geza; Homola, Tamas; Bakay, Arpad; and Horvath, Mihaly, 5,150,749, Cl. 165-115.000.
Homonoff, Edward C.; Meierhoefer, Alan W.; and Flint, Lori B., to Dexter Corporation, The. Hydroentangled spunbonded composite fabric and process. 5,151,320, Cl. 428-284.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kobayashi, Tsutomu; and Kojima, Kazuo, 5,150,593, Cl. 70-248.000.

Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000.
Muller, Klaus; and Kulhanek, Antonin, 5,151,162, Cl. 294-131.000.
Yoshida, Suguru; Tsunoda, Isao; and Sano, Shoichi, 5,150,944, Cl. 296-203.000.
Yoshino, Ryutaro; Gomi, Hiroshi; Nishikawa, Masao; and Hirose, Masato, 5,151,859, Cl. 364-424.020.

Honeywell Inc.: *See*—
Adams, John T.; and Tinsley, Timothy M., 5,151,854, Cl. 364-184.000.
Johnson, Donald D.; and Yee, Jimmy, 5,151,591, Cl. 250-214.00B.

Hong, Pi-Lien. Paper package for beverage. 5,150,833, Cl. 229-125.150.

Honkanen, Erkki J.: *See*—
Backstrom, Reijo J.; Heinola, Kalevi E.; Nore, Pentti T.; Pystynen, Jarmo J.; Honkanen, Erkki J.; and Haikala, Heimo O., 5,151,420, Cl. 514-247.000.

Honkanen, Seppo, to Oy Nokia AB. Adaptor device for coupling together optical waveguides produced by K-Na ion exchange with optical waveguides produced by Ag-Na ion exchange. 5,151,958, Cl. 385-50.000.

Honma, Hiroshi: *See*—
Hagio, Akira; Ono, Yoshimi; and Honma, Hiroshi, 5,150,931, Cl. 285-381.000.

Honma, Hisanori: *See*—
Fujiwara, Takayoshi; and Honma, Hisanori, 5,151,021, Cl. 418-93.000.

Hooper, Donald F.; Finnerty, James L.; Fite, David B.; and Kundu, Snehamay, to Digital Equipment Corporation. Method of minimizing sum-of-product cases in a heterogeneous data base environment for circuit synthesis. 5,151,867, Cl. 364-489.000.

Hoover Treated Wood Products, Inc.: *See*—
Herndon, James F.; and Morgan, Dennis J., 5,151,225, Cl. 252-607.000.

Hoover Universal, Inc.: *See*—
Hein, Richard A., 5,150,632, Cl. 74-530.000.

Hopkins, P. Donald: *See*—
Kukes, Simon G.; Clark, Frederick T.; Hopkins, P. Donald; and Green, Lisa M., 5,151,172, Cl. 208-144.000.

Hopper, Marvin L.; and King, Jerry W., to United States of America, Health and Human Services. Supercritical fluid extraction enhancer. 5,151,188, Cl. 210-634.000.

Hoptry, David A.; Petrofes, James M.; Shal, David A.; and Denton, Gary R., to General Motors Corporation. Motor vehicle suspension with damper having rotatable member position feedback. 5,150,915, Cl. 280-707.000.

Hoptry, David A.: *See*—
Petrofes, James M.; Shal, David A.; Denton, Gary R.; and Hoptry, David A., 5,150,916, Cl. 280-707.000.

Hopwell, Brian L.; Dale, Nicholas C.; and Burns, Bryan R. A., deceased (by Burns, Jean H., administrator), to British Aerospace Public Limited Company. Jettisonable aerodynamic control surfaces. 5,150,858, Cl. 244-45.00A.

Horai, Keiichiro: *See*—
Kawahara, Katsumi; Uchida, Masami; Yoshioka, Kazumi; Ohta, Takeo; and Horai, Keiichiro, 5,151,295, Cl. 427-12.000.

Hori, Hirokazu: *See*—
Ishihara, Makoto; Kiminami, Kazuhiro; Wakabayashi, Masakazu; Hori, Hirokazu; Tatsu, Saneharu; and Takeshita, Sachio, 5,151,234, Cl. 264-176.100.

Hori, Tsuguo, to NEC Corporation. Signal control apparatus capable of readily changing an apparatus output signal. 5,152,008, Cl. 455-127.000.

Horinouchi, Kazuyuki: *See*—
Satou, Hiroki; and Horinouchi, Kazuyuki, 5,151,613, Cl. 307-243.000.

Horn, Alan S., deceased (by Horn, Mark, legal representative); and Dubocovich, Margarita L., to Northwestern University. Substituted 2-amidotetralins as melatonin agonists and antagonists. 5,151,446, Cl. 514-617.000.

Horn, Mark, legal representative: *See*—
Horn, Alan S., deceased; and Dubocovich, Margarita L., 5,151,446, Cl. 514-617.000.

Horvath, Mihaly: *See*—
Bergmann, Gyorgy; Hivessy, Geza; Homola, Tamas; Bakay, Arpad; and Horvath, Mihaly, 5,150,749, Cl. 165-115.000.

Hoshiba, Akihiro; Okazaki, Masaki; and Hasegawa, Junichi, to Sanshin Kogyo Kabushiki Kaisha. Fuel supplying device for marine propulsion engine. 5,150,673, Cl. 123-179.150.

Hoshide, Yasuo: *See*—
Morita, Yoshiharu; Chaki, Haruyuki; Hoshide, Yasuo; and Takashima, Junko, 5,151,521, Cl. 548-112.000.

Hoshino, Kouichi: *See*—
Suzuki, Yasutoshi; Awano, Namoi; Hoshino, Kouichi; and Inuzuka, Hajime, 5,151,764, Cl. 357-27.000.

Hosogi, Yasuyuki: *See*—
Suzuki, Aimi; Azuma, Toshiaki; Kimura, Shigeaki; and Hosogi, Yasuyuki, 5,151,404, Cl. 503-200.000.

Hosoya, Mutsumi: *See*—
Goto, Eiichi; Hioe, Willy; Hosoya, Mutsumi; and Kamikawai, Ryotaro, 5,151,617, Cl. 307-462.000.

Hough, Geoffrey S., to Rolls-Royce plc. Liquid cooled aerofoil blade. 5,151,012, Cl. 416-95.000.

Howard, Brian D.: *See*—
Bailey, Robert L.; and Howard, Brian D., 5,151,997, Cl. 395-800.000.

Hozumi, Hiroyuki, to Jamco Corporation. Lavatory unit for a passenger airplane. 5,150,863, Cl. 244-118.500.

Hsu, Fu-Lian; and Ashman, William P., to United States of America, Army. 4-[1-(1-naphthalenyl)ethyl]-1H-imidazole, method of making and use as an anesthetic. 5,151,526, Cl. 548-335.000.

Hsu, Joseph C. S.: *See*—
Kao, Jamee; and Hsu, Joseph C. S., 5,151,151, Cl. 156-471.000.

Hsu, Kaven. Spindle means of machine center. 5,150,994, Cl. 409-135.000.

Hsu, Li J. Elastic connector. 5,150,997, Cl. 411-511.000.

Hsu, Wen-Liang; and Halasa, Adel F., to Goodyear Tire & Rubber Company, The. Catalyst for the synthesis of crystalline 3,4-polyisoprene. 5,151,398, Cl. 502-117.000.

Hsueh, Paul W.; and Smith, Douglas D., to Motorola, Inc. Sense amplifier with latch. 5,151,879, Cl. 365-190.000.

Hu, Ho-Pin; Katsnelson, Inessa; and Sellinger, Alan, to Gelman Sciences, Inc. Cationic charge modified microporous membrane. 5,151,189, Cl. 210-635.000.

Hubbard, Vance M.; and Brunson, Welton K., to Tecnol Medical Products, Inc. Liquid shield visor for a surgical mask with a bottom notch to reduce glare. 5,150,703, Cl. 128-206.120.

Hubby, Christopher M.: *See*—
Nguygen, Thanh D.; and Hubby, Christopher M., 5,151,227, Cl. 264-41.000.

Huber, David R., to General Instrument Corporation. Laser with longitudinal mode selection. 5,151,908, Cl. 372-6.000.

Huber, Hans F.: *See*—
Smith, Hylton H.; Huber, Hans F.; and Muller, Hartmut, 5,151,493, Cl. 528-272.000.

Hubert, Jean-Claude: *See*—
Guinet, Jannick; Hubert, Jean-Claude; Jarrige, Jean; Mexmain, Jacques; and Michelet, Jean-Pascal, 5,150,830, Cl. 228-124.000.

Hudson Valley Tree, Inc.: *See*—
Spiegel, Si; and Smith, Sherman, 5,150,874, Cl. 248-514.000.

Huercanos, Joaquin. Evaporation assembly with vapor circulating means. 5,151,154, Cl. 159-13.200.

Huette, Gerard: *See*—
Canu, Jean Pierre; DesForges, Bernard; and Huette, Gerard, 5,151,952, Cl. 382-29.000.

Hughes Aircraft Company: *See*—
Ansley, David A., 5,151,799, Cl. 359-11.000.
Bakhit, Gabriel G.; and Shambrook, Kevin P., 5,151,388, Cl. 437-209.000.
Chen, Chungte W., 5,151,823, Cl. 359-565.000.
Dewhirst, Donald R., 5,151,626, Cl. 310-331.000.
Fries, William M., 5,150,827, Cl. 228-44.700.
Grinberg, Jan; O'Meara, Thomas R.; Owechko, Yuri; Pedinoff, Melvin E.; and Soffer, Bernard H., 5,151,814, Cl. 359-209.000.
Harvey, Robin J., 5,151,663, Cl. 330-41.000.
Nourrcier, Charles E., 5,151,747, Cl. 356-5.000.

Hughes Danbury Optical Systems, Inc.: *See*—
Siebert, Edward T., 5,151,585, Cl. 250-201.900.

Hughes, Michael J.: *See*—
Jordan, Robert E.; and Hughes, Michael J., 5,150,831, Cl. 228-184.000.

Huijben, Gregorius J.; van Kralingen, Cornelis G.; Liem, Seeng D; and Paoli, Michele E., to Lever Brothers Company, Division of Conopco, Inc. Detergent powders and process for their preparation. 5,151,208, Cl. 252-174.140.

Hullender, Gregory N., to Go Corporation. Method for recognizing handwritten characters using shape and context analysis. 5,151,950, Cl. 382-13.000.

Huls Aktiengesellschaft: *See*—
Smith, Hylton H.; Huber, Hans F.; and Muller, Hartmut, 5,151,493, Cl. 528-272.000.

Hultman, Dave A.: *See*—
Joseph, Daniel D.; and Hultman, Dave A., 5,150,607, Cl. 73-64.480.

Hunt, Rodney J.; and Kip, Ruloff F., Jr., to AT&T Bell Laboratories. Payout tube with improved locking means. 5,150,852, Cl. 242-157.00R.

Hunt, Terry J.; and Breda, Michael A., to General Motors Corporation. Heat transfer fin with dammed segments. 5,150,596, Cl. 72-186.000.

Huong, Chin-Fu. Vehicle automatic transmission system. 5,151,067, Cl. 475-43.000.

Huppi, Michael, to Asea Brown Boveri Ltd. Semiconductor component. 5,151,766, Cl. 357-38.000.

Hurwitch, Carl B.: *See*—
Lundy, Douglas A.; Jugle, Kip L.; MacDonald, Daniel W.; Berman, Robin E.; and Hurwitch, Carl B., 5,151,744, Cl. 355-296.000.

Hutchings, David A.; and Brandon, Richard L., to Mead Corporation, The. Liquid crystal polymers containing a repeating bisoxazole structure. 5,151,488, Cl. 528-179.000.

Huvey, Michel, to Institut Francais du Petrole. Device for continuous manufacture of bent rods with shaped cross sections using an intermediate strip. 5,151,281, Cl. 425-505.000.

Huynh, Van T., to Institut National de la Sante et de la Recherche Medicale. Methods and apparatuses for preparative electrophoresis. 5,151,165, Cl. 204-299.00R.

Hvezda, Jaroslav M.; Fisher, Robert W.; Olszewski, Edward J.; Morrin, Hugh F. C.; and Glover, Richard J., to Northern Telecom Limited. Ferrule alignment assembly for blind mating optical fiber connector. 5,151,961, Cl. 385-60.000.

Hwang-Felgner, Jiin-Yu; Jones, Richard E.; and Maher, James F., to Genentech, Inc. Gamma interferon formulation. 5,151,265, Cl. 424-85.500.

Hwang, Ren-Yi. Kinetic art article assembly with stacked color filters. 5,151,829, Cl. 359-886.000.

Hwang, Wen-Fang: *See*—
Harris, William J.; and Hwang, Wen-Fang, 5,151,489, Cl. 528-183.000.

Hy-Tech Hydraulics, Inc.: *See*—
Major, Kenneth E.; Baker, John L.; and Braunagel, David K., 5,150,769, Cl. 184-31.000.
Major, Kenneth E.; Baker, John L.; and Braunagel, David K., 5,150,975, Cl. 384-465.000.

Hyde, Robert E. Liquid pressure amplification with superheat suppression. 5,150,580, Cl. 62-86.000.

Hydrocarbon Filtration Systems, Inc.: *See*—
Simpson, Stewart A.; and Dicke, Rock D., 5,151,194, Cl. 210-680.000.

Hyer, Michael L.: *See*—
Hyer, Raymond E.; and Hyer, Michael L., 5,150,884, Cl. 254-209.000.

Hyer, Raymond E.; and Hyer, Michael L. Carpet stretcher attachment utilizing pivotally mounted pulling plate. 5,150,884, Cl. 254-209.000.

Hynecek, Jaroslav, to Texas Instruments Incorporated. Method of making top buss virtual phase frame interline transfer CCD image sensor. 5,151,380, Cl. 437-53.000.

Iai, Kenichiro, to Yoshida Kogyo K.K. Drawing device for use in drafting machine. 5,150,525, Cl. 33-18.100.

Ibiden Co., Ltd: *See*—
Hiroi, Atsushi; Kondo, Mitsuhiro; and Ohshima, Kinya, 5,151,771, Cl. 357-70.000.

Ibsen, Robert L.; Pacropis, Donald R.; and Glace, William R., to Den-Mat Corporation. Light-curable ionomer dental cement. 5,151,453, Cl. 522-14.000.

Ichihara, Akira, to Alps Electric Co., Ltd. Disk chucking device. 5,151,836, Cl. 360-99.080.

Ichijima, Seiji: *See*—
Abe, Akira; Mihayashi, Keiji; and Ichijima, Seiji, 5,151,344, Cl. 430-383.000.

Ichikawa, Hiroyuki: *See*—
Kuwana, Kazutaka; Yoshida, Tsuyoshi; Ichikawa, Hiroyuki; and Tozu, Kenji, 5,150,952, Cl. 303-109.000.

Ichikoh Industries, Ltd.: *See*—
Tanaka, Morimasa, 5,151,563, Cl. 200-6.00A.

Idaka, Yukio; Yamaguchi, Shuichiroh; Miyajima, Hisakazu; Matsumoto, Takeshi; and Miyamoto, Yasunori, to Matsushita Electric Works, Ltd. Semiconductor relay circuit using photovoltaic diodes. 5,151,602, Cl. 250-551.000.

Ide, Hiroshi: *See*—
Mita, Seiichi; Izumita, Morishi; Ide, Hiroshi; Doi, Nobukazu; Okada, Yoshinori; and Inagaki, Yasuo, 5,151,924, Cl. 375-12.000.

Ide, Satoshi: *See*—
Uchida, Takayuki; Ide, Satoshi; Yamamoto, Masahiro; and Yumoto, Atsushi, 5,150,598, Cl. 72-325.000.

Idemitsu Kosan Co., Ltd.: *See*—
Shigematsu, Kazuyoshi; Nakagawa, Takashi; and Sakamoto, Shuji, 5,151,531, Cl. 552-115.000.

Iehisa, Nobuaki; and Yamazaki, Etsuo, to Fanuc Ltd. Electric discharge tube for gas laser. 5,151,916, Cl. 372-61.000.

Igarashi, Mayumi: *See*—
Kabuto, Nobuaki; Igarashi, Mayumi; Inoue, Fumio; and Ando, Kunio, 5,151,689, Cl. 340-784.000.

Igarashi, Yasuyuki: *See*—
Handa, Kazuko; Igarashi, Yasuyuki; Ahmad, Mahammad N.; and Hakomori, Sen-Itiroh, 5,151,360, Cl. 435-240.200.

Igawa, Tatsuya, to Kabushiki Kaisha Pilot. Magnetophoretic display panel. 5,151,032, Cl. 434-409.000.

Ige, Hitoshi: *See*—
Mukai, Nobuhiro; Ige, Hitoshi; Makino, Takayuki; and Atarashi, Junko, 5,151,479, Cl. 526-277.000.

Ihly, Eugen F., to Ihly Industries, Inc. Process and apparatus for working an edge portion of a container flange. 5,150,595, Cl. 72-124.000.

Ihly Industries, Inc.: *See*—
Ihly, Eugen F., 5,150,595, Cl. 72-124.000.

Iida, Nozomi: *See*—
Hannya, Shuichi; and Iida, Nozomi, 5,150,542, Cl. 49-441.000.

Iio, Keiji: *See*—
Ishida, Yuzuru; Inoue, Haruo; Otsuka, Ichiro; Takaku, Masato; Mitsuboshi, Masahiro; Iio, Keiji; and Hashimoto, Atsushi, 5,151,457, Cl. 524-157.000.

IIT Research Institute: *See*—
Hales, Crispin; and Zabinski, Thomas E., 5,151,303, Cl. 427-178.000.

Iizawa, Ryuji: *See*—
Taniguchi, Yoshiaki; Watanabe, Masaki; Iizawa, Ryuji; and Mori, Fumitoshi, 5,151,860, Cl. 364-424.050.

Iizumi, Kenichi: *See*—
Murakami, Koichi; Matsuo, Kazuhiro; Iizumi, Kenichi; and Tagawa, Yoichi, 5,150,998, Cl. 412-14.000.

Ijiri, Masaaki: *See*—
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.

Ikeda Bussan Co., Ltd.: *See*—
Isomura, Tohru, 5,150,872, Cl. 248-429.000.

Ikeda, Hiroyuki; Shinka, Michitoshi; Tayama, Suehiro; Sawano, Tetuya; and Saruta, Masahiro, to Mitsubishi Rayon Co., Ltd. Process for the production of methacrylic resin sheets. 5,151,482, Cl. 526-329.700.

Ikeda, Osamu: *See*—
Matsumoto, Shigeyuki; and Ikeda, Osamu, 5,151,305, Cl. 427-252.000.

Ikeda, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Read-only memory having data register for holding output data. 5,151,876, Cl. 365-94.000.

Ikeda, Yoshito: *See*—
Sakata, Matsumi; Kumura, Tatsuo; Suzuki, Atsushi; Ikeda, Yoshito; Aoki, Kaoru; Kojima, Naoto; and Mishima, Akio, 5,150,511, Cl. 29-603.000.

Ikemoto Burashi Kogyo Kabushiki Kaisha: *See*—
Ikemoto, Shigeki, 5,150,491, Cl. 15-1.520.

Ikemoto, Isao: *See*—
Tsuda, Tadayuki; Watanabe, Kazushi; Ikemoto, Isao; and Sasaki, Shinichi, 5,151,734, Cl. 355-200.000.

Ikemoto, Shigeki, to Ikemoto Burashi Kogyo Kabushiki Kaisha. Hair brush. 5,150,491, Cl. 15-1.520.

Illinois Tool Works Inc.: *See*—
Beebe, James C.; Cargould, Barry D.; and Lees, David W., Sr., 5,151,870, Cl. 364-556.000.

Im, Chang J.: *See*—
Wolfe, Richard A.; Im, Chang J.; and Wright, Robert E., 5,151,159, Cl. 202-118.000.

Imai, Isamu; Yotsumoto, Toshihiro; Inada, Norio; Toki, Shigeyuki; Sato, Maki; and Wada, Ichiro, to Bridgestone Corporation. Heavy duty pneumatic radial tires using rubber reinforcing fiber cords with improved adhesion. 5,151,142, Cl. 152-565.000.

Imai, Jun: *See*—
Irikura, Tsutomu; Uchida, Hirohsi; Imai, Jun; and Komuro, Masakatsu, 5,151,434, Cl. 514-300.000.

Imai, Masahito: *See*—
Kondo, Munenari; Imai, Masahito; Narita, Ryoichi; and Maeda, Takushi, 5,150,616, Cl. 73-517.00R.

Imai, Tetuya, to Otsuka Kagaku Kabushiki Kaisha. Process for preparing imidazolidine-2,5-dione derivative. 5,151,524, Cl. 548-307.000.

Imajo, Minoru, to Nissan Motor Co., Ltd. Engine fuel injector. 5,150,691, Cl. 123-531.000.

Imam, M. A.: *See*—
Provenzano, Virgil; Singh, Anand K.; Imam, M. A.; Sadananda, Kuntimadi; and Henshaw, William F., 5,151,407, Cl. 505-1.000.

Imamura, Kenichi: *See*—
Yokoyama, Naoki; and Imamura, Kenichi, 5,151,618, Cl. 307-471.000.

Imaya, Akihiko: *See*—
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000.

Immorlica, Anthony A., Jr.; and Chase, Robert F., to General Electric Company. Optically patterned RF shield for an integrated circuit chip for analog and/or digital operation at microwave frequencies. 5,151,769, Cl. 357-53.000.

Imperial Chemical Industries PLC: *See*—
Greenshields, James N.; and Walters, Peter P., 5,151,269, Cl. 424-401.000.
Price, Anthony, 5,151,217, Cl. 252-312.000.

Inaba, Bonpei: *See*—
Ito, Hiroshi; Ando, Seigo; and Inaba, Bonpei, 5,151,793, Cl. 358-335.000.

Inaba, Hitoshi; Nishijima, Kazumi; Kato, Kazuo; Yamamoto, Ichiro; Mochida, Ei; and Ohtomo, Kikuo, to Mochida Pharmaceutical Co., Ltd.; and Hodogaya Chemical Co., Ltd. 4,5-dihydro-6H-imidazo[4,5,1-ij]quinolin-6-one-6-oxime-O-sulfonic acid derivatives useful for treating hypertension or edema. 5,151,431, Cl. 514-292.000.

Inada, Haruhiro: *See*—
Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiro; Hirashima, Isao; and Ushijima, Kazuhiro, 5,150,919, Cl. 280-732.000.

Inada, Norio: *See*—
Imai, Isamu; Yotsumoto, Toshihiro; Inada, Norio; Toki, Shigeyuki; Sato, Maki; and Wada, Ichiro, 5,151,142, Cl. 152-565.000.

Inagaki, Hidemitsu: *See*—
Yamashita, Mitugu; Kawamoto, Mutsumi; and Inagaki, Hidemitsu, 5,150,763, Cl. 180-252.000.

Inagaki, Yasuo: *See*—
Mita, Seiichi; Izumita, Morishi; Ide, Hiroshi; Doi, Nobukazu; Okada, Yoshinori; and Inagaki, Yasuo, 5,151,924, Cl. 375-12.000.

INAX Corporation: *See*—
Ito, Takeshi; and Murata, Kazushige, 5,151,275, Cl. 425-84.000.

Industrial Technology Research Institute: *See*—
Lin, Ming-Zen, 5,151,620, Cl. 307-475.000.
Wu, Neng-Wei, 5,151,374, Cl. 437-40.000.

Ingersoll, Thomas: *See*—
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, 5,150,748, Cl. 165-41.000.

Inglish, David S.: *See*—
Liljegren, Gordon E.; and Inglish, David S., 5,151,725, Cl. 352-129.000.

Inn-Room Systems, Inc.: *See*—
Livingston, Troy W., 5,150,817, Cl. 221-81.000.

Inoue, Akira, to Mitsubishi Denki Kabushiki Kaisha. Shielded semiconductor device. 5,151,770, Cl. 357-53.000.

Inoue, Fumio: *See*—
Kabuto, Nobuaki; Igarashi, Mayumi; Inoue, Fumio; and Ando, Kunio, 5,151,689, Cl. 340-784.000.
Inoue, Haruo: *See*—
Ishida, Yuzuru; Inoue, Haruo; Otsuka, Ichiro; Takaku, Masato; Mitsuboshi, Masahiro; Iio, Keiji; and Hashimoto, Atsushi, 5,151,457, Cl. 524-157.000.
Inoue, Hiroshi; Kato, Toshikazu; and Ogawara, Kensuke, to Tosoh Corporation; and Toso Susteel Co., Ltd. Process for producing poly (para-phenylene-sulfide). 5,151,495, Cl. 528-388.000.
Inoue, Masakazu, to Inoue Seisakusho (Mfg) Co., Ltd. Planetary mixer. 5,150,968, Cl. 366-288.000.
Inoue, Michihiro: *See*—
Yamada, Toshio; and Inoue, Michihiro, 5,151,878, Cl. 365-189.010.
Inoue Seisakusho (Mfg) Co., Ltd.: *See*—
Inoue, Masakazu, 5,150,968, Cl. 366-288.000.
Insight Telecast, Inc.: *See*—
Young, Patrick, 5,151,789, Cl. 358-194.100.
Institut Francais du Petrole: *See*—
Huvey, Michel, 5,151,281, Cl. 425-505.000.
Lessi, Jacques; and Wittrisch, Christian, 5,150,750, Cl. 166-66.400.
Institut National de la Sante et de la Recherche Medicale: *See*—
Huynh, Van T., 5,151,165, Cl. 204-299.00R.
International Business Machines Corporation: *See*—
Abraham, Robert L.; Priven, Michael P.; and Moorman, Thomas P., 5,151,987, Cl. 395-575.000.
Allen, James D.; and King, Steven A., 5,151,990, Cl. 395-650.000.
Austin, John S.; Piro, Ronald A.; and Stout, Douglas W., 5,151,619, Cl. 307-473.000.
Bleich, Herman E.; Franco, Luis P.; and Sanders, Ian L., 5,151,294, Cl. 427-11.000.
Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., 5,151,559, Cl. 174-52.400.
Fredericks, Kenneth J.; and Lynch, Kenneth R., 5,151,977, Cl. 395-200.000.
Galyon, George T.; Jordhamo, George M.; and Wirtz, Louis H., 5,151,169, Cl. 205-151.000.
Hatchett, Michael R.; Hearn, Anthony R.; and Lacey, Charles M., 5,150,512, Cl. 29-603.000.
Johnson, Donavon W.; Shaheen-Gouda, Amal A.; and Smith, Todd A., 5,151,989, Cl. 395-600.000.
Kaiser, Lutz; Kimmerle, Eugen; Mirbach, Erich; and Notter, Frank, 5,151,041, Cl. 439-157.000.
Lee, Kang-Wook, 5,151,304, Cl. 427-250.000.
Lyke, David G.; and Ominsky, Mark, 5,151,948, Cl. 382-7.000.
McClelland, Gary M., 5,151,594, Cl. 250-306.000.
Meyerson, Bernard S.; Scott, Bruce A.; and Wolford, Donald J., Jr., 5,151,383, Cl. 437;101-.
Westcott, Douglas W.; and White, Valerie, 5,151,981, Cl. 395-375.000.
International Computers Limited: *See*—
Poskitt, Geoffrey, 5,151,979, Cl. 395-325.000.
International Flavors & Fragrances Inc.: *See*—
Rutherford, Howard J., 5,150,722, Cl. 131-335.000.
Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori; and Ito, Toshiyuki, to Canon Kabushiki Kaisha. Light quantity control device. 5,151,910, Cl. 372-31.000.
Inuzuka, Hajime: *See*—
Suzuki, Yasutoshi; Awano, Namoi; Hoshino, Kouichi; and Inuzuka, Hajime, 5,151,764, Cl. 357-27.000.
Invitro Scientific Products, Inc.: *See*—
Serkes, Jonathan M.; and St. Pierre, Richard C., 5,151,366, Cl. 435-285.000.
Irani, Rustom F.: *See*—
Kazerounian, Reza; Eitan, Boaz; and Irani, Rustom F., 5,151,375, Cl. 437-43.000.
Irie, Nobuhiko: *See*—
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.
Irikura, Tsutomu; Uchida, Hirohsi; Imai, Jun; and Komuro, Masakatsu, to Kyorin Seiyaku Kabushiki Kaisha. Controlled-release composition and the preparation thereof. 5,151,434, Cl. 514-300.000.
Irish, Gary H.: *See*—
Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., 5,151,559, Cl. 174-52.400.
Isaacson, James D.: *See*—
Navarro, Thomas L.; and Isaacson, James D., 5,150,626, Cl. 74-84.00R.
Iscar Ltd.: *See*—
Friedmann, Jacob, 5,150,992, Cl. 407-110.000.
Ishibashi, Tadashi: *See*—
Kawaguchi, Hideo; Takeuchi, Kouji; Ishibashi, Tadashi; Shimizu, Norio; and Odawara, Yoji, 5,151,362, Cl. 435-240.250.
Ishibashi, Yoriyuki; Hirano, Ryoichi; and Nishida, Jun, to Kabushiki Kaisha Toshiba. Method and an apparatus for measuring a displacement between two objects and a method and an apparatus for measuring a gap distance between two objects. 5,151,754, Cl. 356-356.000.
Ishida, Masayuki: *See*—
Goto, Kenji; Tsukamoto, Manabu; Ishida, Masayuki; and Ishida, Yoshinobu, 5,151,830, Cl. 360-32.000.
Ishida, Toshimichi; and Suzuki, Masaki, to Matsushita Electric Industrial Co., Ltd. Substrate transfer apparatus. 5,151,008, Cl. 414-744.500.
Ishida, Yoshinobu: *See*—
Goto, Kenji; Tsukamoto, Manabu; Ishida, Masayuki; and Ishida, Yoshinobu, 5,151,830, Cl. 360-32.000.
Ishida, Yuzuru; Inoue, Haruo; Otsuka, Ichiro; Takaku, Masato; Mitsuboshi, Masahiro; Iio, Keiji; and Hashimoto, Atsushi, to Mitsui Toatsu Chemicals, Inc. Resin compositions having improved antistatic properties. 5,151,457, Cl. 524-157.000.
Ishiguro, Masaaki; Tanaka, Toshizumi; and Takagi, Yukio, to Fuji Photo Optical Co., Ltd. Ultrasound-imaging diagnostic system. 5,150,715, Cl. 128-662.060.
Ishihara, Makoto; Kiminami, Kazuhiro; Wakabayashi, Masakazu; Hori, Hirokazu; Tatsu, Saneharu; and Takeshita, Sachio, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Method for the manufacture of thermoplastic resin sheets. 5,151,234, Cl. 264-176.100.
Ishihara, Masamichi: *See*—
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000.
Ishihata, Akira: *See*—
Ohmine, Toshimitsu; Akagawa, Keiichi; and Ishihata, Akira, 5,151,133, Cl. 118-725.000.
Ishii, Mitsuo: *See*—
Nammatsu, Akihiro; Ishii, Mitsuo; and Minezaki, Shigehiro, 5,151,298, Cl. 427-77.000.
Ishii, Yutaka: *See*—
Tanaka, Masaru; and Ishii, Yutaka, 5,151,688, Cl. 340-707.000.
Ishikawa Gasket Co., Ltd.: *See*—
Udagawa, Tsunekazu, 5,150,910, Cl. 277-235.00B.
Ishikawa, Masahiro, to Nissan Motor Co., Ltd. Circuit for eliminating digital noise or short pulses utilizing set/reset shift register. 5,151,612, Cl. 307-234.000.
Ishikawa, Tadayuki: *See*—
Kitabayashi, Hiroyuki; and Ishikawa, Tadayuki, 5,151,109, Cl. 51-297.000.
Ishiyama, Tatsunori: *See*—
Ohzeki, Yukihiro; Araya, Junji; Ishiyama, Tatsunori; Sato, Yasushi; and Nakahata, Kimio, 5,151,736, Cl. 355-208.000.
Ishizu, Masanori: *See*—
Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori; and Ito, Toshiyuki, 5,151,910, Cl. 372-31.000.
Ishizuka, Yasushi: *See*—
Ueda, Toru; Ishizuka, Yasushi; Togawa, Fumio; and Aramaki, Takashi, 5,151,951, Cl. 382-19.000.
Isoda, Takeshi: *See*—
Aoki, Hiroyuki; Suzuki, Tadashi; Katahata, Toshio; Haino, Mutsuo; Nishimura, Genshiro; Kaya, Hiroshi; Tamura, Kozaburo; and Isoda, Takeshi, 5,151,390, Cl. 501-95.000.
Isomura, Tohru, to Ikeda Bussan Co., Ltd. Power seat slide device. 5,150,872, Cl. 248-429.000.
Itagaki, Takushi: *See*—
Deguchi, Mikio; Itagaki, Takushi; and Usui, Masaaki, 5,151,373, Cl. 437-2.000.
Ito, Hiroshi; Ando, Seigo; and Inaba, Bonpei, to Pioneer Electronic Corporation. Recording medium playing apparatus. 5,151,793, Cl. 358-335.000.
Ito, Isamu: *See*—
Araki, Yozo; Ito, Isamu; Sugimura, Tohru; Suzuki, Migaku; and Ochi, Mitsuzo, 5,150,562, Cl. 53-438.000.
Ito, Kazuhiko: *See*—
Matsuno, Yoshio; Choji, Shinichiro; Ito, Kazuhiko; and Shigeta, Teruaki, 5,151,850, Cl. 362-75.000.
Ito, Shoichi: *See*—
Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, 5,151,696, Cl. 341-22.000.
Ito, Takeshi; and Murata, Kazushige, to INAX Corporation. Sealing construction for a pressure casting mold. 5,151,275, Cl. 425-84.000.
Ito, Toshiyuki: *See*—
Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori; and Ito, Toshiyuki, 5,151,910, Cl. 372-31.000.
Ito, Yasuo; and Kyogoku, Hiroshi, to Canon Kabushiki Kaisha. Image reading apparatus having a D/A converter with a controllable output. 5,151,796, Cl. 358-461.000.
Ito, Yuusuke: *See*—
Otsuka, Saburo; Ito, Yuusuke; Yoshikawa, Toshiyuki; and Tokuda, Shoichi, 5,151,271, Cl. 424-443.000.
Itoh, Kazumine: *See*—
Yamamoto, Masanobu; and Itoh, Kazumine, 5,151,813, Cl. 359-202.000.
Itoh, Toshiyuki: *See*—
Nakayama, Okihiko; Tsuda, Hiroshi; Mizushima, Katsuhiko; Itoh, Toshiyuki; and Ueno, Hiroshi, 5,151,862, Cl. 364-454.000.
Itozaki, Hideo: *See*—
Tanaka, Saburo; Nakanishi, Hidenori; and Itozaki, Hideo, 5,151,408, Cl. 505-1.000.
Itsuji, Junichi, to Nippon CMK Corp. Method for forming a carbon resistance in a printed wiring board. 5,151,299, Cl. 427-96.000.
Itsuji, Junichi, to Nippon CMK Corp. Method for forming a carbon resistance in a printed wiring board. 5,151,300, Cl. 427-96.000.
ITT Corporation: *See*—
Mosquera, Rene A., 5,151,049, Cl. 439-353.000.

Sears, Lawrence; and Wall, John T., 5,151,017, Cl. 417-45.000.
IVAC Corporation: *See*—
Goldberg, Jack; and Rosati, Robert J., 5,150,969, Cl. 374-128.000.
Iwai, Hidetoshi: *See*—
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000.
Iwai, Yoshio: *See*—
Wakita, Naohide; Iwai, Yoshio; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Johten, Kazuhiro; Kimura, Satoshi; and Fujiwara, Shozo, 5,151,803, Cl. 359-56.000.
Iwamoto, Akikazu: *See*—
Morimoto, Kiyoshi; Iwamoto, Akikazu; Shimizu, Masahiko; Miwa, Teiichi; and Murata, Kazue, 5,150,990, Cl. 406-50.000.
Iwamoto, Hiroyuki: *See*—
Tamamura, Koushi; and Iwamoto, Hiroyuki, 5,151,912, Cl. 372-46.000.
Iwamoto, Yasunori: *See*—
Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiro; Hirashima, Isao; and Ushijima, Kazuhiro, 5,150,919, Cl. 280-732.000.
Iwasaki, Shuji; Kagayama, Toshi; and Kamata, Kazuya, to Tosoh Corporation. Apparatus for separate injection of reagent. 5,150,821, Cl. 222-132.000.
Iwasawa, Kyoko; Tanaka, Yoshikazu; and Gotou, Shizuo, to Hitachi, Ltd. Parallelization compile method and system. 5,151,991, Cl. 395-700.000.
Iwashita, Tomonori; Egawa, Akira; and Sugiyama, Yoshiaki, to Canon Kabushiki Kaisha. Camera or printer capable of automatically changing print size. 5,151,726, Cl. 354-75.000.
Iwata, Kunio: *See*—
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000.
Iwazaki, Toshiaki: *See*—
Nakano, Hirofumi; Kawada, Shozo; Uosaki, Yoichi; Saito, Yutaka; Gomi, Katsushige; and Iwazaki, Toshiaki, 5,151,352, Cl. 435-123.000.
Izumi, Yuji: *See*—
Mori, Tatsushi; Kobayashi, Hisao; and Izumi, Yuji, 5,151,020, Cl. 418-55.200.
Izumita, Morishi: *See*—
Mita, Seiichi; Izumita, Morishi; Ide, Hiroshi; Doi, Nobukazu; Okada, Yoshinori; and Inagaki, Yasuo, 5,151,924, Cl. 375-12.000.
J & L Industries, Inc.: *See*—
Beaulleu, Norman R.; Clark, David E.; Clingman, Arthur B., III; Jeffrey, Richard F.; Mahlum, James A.; and Reeves, Larry E., 5,151,075, Cl. 493-179.000.
J. M. Voith GmbH: *See*—
Schiel, Christian, 5,151,156, Cl. 162-368.000.
Jack, David E., to Prevent-A-Crime International, Inc. Method of making a stencil for etching glass. 5,151,572, Cl. 219-121.690.
Jack, Gregory S.: *See*—
El-Hibri, Mohammad J.; Jack, Gregory S.; Kelly, William E.; and Patel, Sanjay R., 5,151,462, Cl. 524-405.000.
Jacks, Wendy S.: *See*—
Smith, Michael G.; Jacks, Wendy S.; Lo, William C.; and Ehr, Robert J., 5,151,113, Cl. 71-92.000.
Jackson, Charles L.: *See*—
Griffith, Scott E.; Tuller, Barry E.; and Jackson, Charles L., 5,151,884, Cl. 368-10.000.
Jackson, Norman C., to Standard Products Company, The. Color match molding and weatherstrip. 5,151,307, Cl. 428-31.000.
Jacob, Friedrich: *See*—
Findeis, Gunter; Jacob, Friedrich; and Schulz, Eberhard, 5,151,733, Cl. 355-45.000.
Jacobson, Boris S.; and DiPerna, Raymond A., to Raytheon Company. Class E power amplifier. 5,151,852, Cl. 363-131.000.
Jacubeit, Matthias: *See*—
Boy, Jurgen; and Jacubeit, Matthias, 5,151,630, Cl. 313-602.000.
Jaffe, Richard A.: *See*—
Allison, A. Christopher; and Jaffe, Richard A., 5,151,088, Cl. 604-192.000.
Jain, Sanjeev; and Vermette, John E., to Baltimore Therapeutic Equipment Co. Isoinertial lifting device. 5,151,071, Cl. 482-101.000.
Jakob, Wolfgang: *See*—
Fennhoff, Gerhard; Jakob, Wolfgang; Ehlert, Manfred; and Freitag, Dieter, 5,151,452, Cl. 521-48.000.
Jamco Corporation: *See*—
Hozumi, Hiroyuki, 5,150,863, Cl. 244-118.500.
Jamzadeh, Fereidoon S.; Chowdry, Arun; and Johnson, Kevin M., to Eastman Kodak Company. Imaging method and apparatus using discrete receiving sheets. 5,151,717, Cl. 346-157.000.
Jang, Yong N.: *See*—
Yoo, Taek J.; Jang, Yong N.; Oh, Wook H.; and Jeong, Chan S., 5,151,186, Cl. 210-541.000.
Janssen Pharmaceutica N.V.: *See*—
Janssens, Frans E.; Diels, Gaston S. M.; and Pille, Geert M. E., 5,151,424, Cl. 514-258.000.
Venet, Marc G.; Sanz, Gerard C.; Raeymaekers, Alfons H. M.; and Freyne, Eddy J. E., 5,151,421, Cl. 514-249.000.
Janssens, Frans E.; Diels, Gaston S. M.; and Pille, Geert M. E., to Janssen Pharmaceutica N.V. Pharmacologically active (Bicyclic heterocyclyl)methyl and -hetero) substituted hexahydro-1H-azepines and pyrrolidines. 5,151,424, Cl. 514-258.000.
Janssens, Wilhelmus; Uytterhoeven, Herman J.; Vermeersch, Joan T.; and Van der Bogaert, Jan A., to Agfa-Gevaert, N.V. Modified dextran binder for use in thermal dye transfer. 5,151,405, Cl. 503-227.000.
Japan Atomic Energy Research Institute: *See*—
Washio, Masakazu; and Kawanishi, Syun-ichi, 5,151,486, Cl. 528-124.000.
Japan Organo Co., Ltd.: *See*—
Sunaoka, Yoshio; Kitazato, Keisuke; and Tsuda, Satoru, 5,151,191, Cl. 210-644.000.
Japan Tobacco Inc.: *See*—
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000.
Jaquiss, Robert D. B.: *See*—
Cox, James L.; and Jaquiss, Robert D. B., 5,150,706, Cl. 128-400.000.
Jarrige, Jean: *See*—
Guinet, Jannick; Hubert, Jean-Claude; Jarrige, Jean; Mexmain, Jacques; and Michelet, Jean-Pascal, 5,150,830, Cl. 228-124.000.
Jaskunas, S. Richard: *See*—
Bang, Nils U.; Beckmann, Robert J.; Jaskunas, S. Richard; Lai, Mei-Huei T.; Little, Sheila P.; Long, George L.; and Santerre, Robert F., 5,151,268, Cl. 424-94.640.
Jaster, Heinz; and Bessler, Warren F., to General Electric Company. Apparatus for controlling a dual evaporator, dual fan refrigerator with independent temperature controls. 5,150,583, Cl. 62-179.000.
Jeffers, Christopher M. Puncture and seal cap apparatus. 5,150,802, Cl. 215-235.000.
Jeffrey, Richard F.: *See*—
Beaulleu, Norman R.; Clark, David E.; Clingman, Arthur B., III; Jeffrey, Richard F.; Mahlum, James A.; and Reeves, Larry E., 5,151,075, Cl. 493-179.000.
Jenner, Andrew: *See*—
Moody, Victor; and Jenner, Andrew, 5,150,642, Cl. 81-57.200.
Jennings, Philip V.: *See*—
Foster, James P.; and Jennings, Philip V., 5,150,541, Cl. 43-131.000.
Jeong, Chan S.: *See*—
Yoo, Taek J.; Jang, Yong N.; Oh, Wook H.; and Jeong, Chan S., 5,151,186, Cl. 210-541.000.
Jeong, Ho-sun; and Han, Hyo-jin, to Samsung Electronics Co., Ltd. Integrated circuit for square root operation using neural network. 5,151,874, Cl. 364-752.000.
Jidoshi Kiki Co., Ltd.: *See*—
Taniguchi, Yoshiaki; Watanabe, Masaki; Iizawa, Ryuji; and Mori, Fumitoshi, 5,151,860, Cl. 364-424.050.
Jiro, Kamezawa, to Tomoe Technical Research Co. Butterfly valve to prevent dew condensation therefrom. 5,150,731, Cl. 137-375.000.
Job, Robert C., to Shell Oil Company. Olefin polymerization catalyst. 5,151,399, Cl. 502-127.000.
Joerg, Klaus; Kummer, Rudolf; and Mueller, Franz-Josef, to BASF Aktiengesellschaft. Process for the preparation of dialkyl carbonates. 5,151,541, Cl. 558-277.000.
Joh. A. Benckiser GmbH: *See*—
Hitz, Hans; Schaefer, Rolf; Baust, Heinrich; and Gross, Wolfgang, 5,151,522, Cl. 548-112.000.
Johannes, Sandor: *See*—
Austin, George K., Jr.; and Johannes, Sandor, 5,150,880, Cl. 251-149.300.
Johns Hopkins University, The: *See*—
Massof, Robert W.; O'Shea, Donald C.; and Raasch, Thomas W., 5,151,722, Cl. 351-158.000.
Waarren, Jeffery W., 5,151,673, Cl. 333-249.000.
Johnsen, Edward L. Electronic inventory label and security apparatus. 5,151,684, Cl. 340-572.000.
Johnson Airspray, Inc.: *See*—
Johnson, Lindley C., 5,151,004, Cl. 414-495.000.
Johnson, Bruce K.: *See*—
Hendry, Donald H.; Johnson, Bruce K.; Krawczyk, Joanne M.; and Vierstra, Bruce C., 5,151,728, Cl. 354-83.000.
Johnson, Dave: *See*—
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, 5,150,748, Cl. 165-41.000.
Johnson, David N.: *See*—
Taylor, Chandler R., Jr.; Cale, Albert D., Jr.; Johnson, David N.; and Stauffer, Harold F., Jr., 5,151,418, Cl. 514-210.000.
Johnson, David O. Ophthalmic lens prism blocking ring. 5,150,547, Cl. 51-216.0LP.
Johnson, Donald D.; and Yee, Jimmy, to Honeywell Inc. Asynchronous signal interrogation circuit for an detection apparatus. 5,151,591, Cl. 250-214.00B.
Johnson, Donavon W.; Shaheen-Gouda, Amal A.; and Smith, Todd A., to International Business Machines Corporation. Directory cache management in a distributed data processing system. 5,151,989, Cl. 395-600.000.
Johnson, Drey: *See*—
Farrow, Robert I.; and Johnson, Drey, 5,150,847, Cl. 242-56.00R.
Farrow, Robert I.; DeMint, Paul; Johnson, Drey; Gaude, Robert; and McNeill, Ray O., 5,150,849, Cl. 242-56.00R.
Johnson, James A. Automated curbside check-in counter. 5,150,760, Cl. 177-245.000.
Johnson & Johnson Medical, Inc.: *See*—
Brown, Craig C., 5,151,314, Cl. 428-198.000.

Johnson, Kenneth L.; and Updike, William A., to Cummins Engine Company, Inc. Insulated exhaust port liner. 5,150,572, Cl. 60-272.000.
Johnson, Kevin M.; and Kowalczyk, Michael S., to Eastman Kodak Company. Photoconductive drum having expandable mount. 5,151,737, Cl. 355-211.000.
Johnson, Kevin M.: *See*—
Jamzadeh, Fereidoon S.; Chowdry, Arun; and Johnson, Kevin M., 5,151,717, Cl. 346-157.000.
Johnson, Lindley C., to Johnson Airspray, Inc. Vehicle for moving aircraft. 5,151,004, Cl. 414-495.000.
Johnson, Lonnie G.; and D'Andrade, Bruce M. Double tank pinch trigger pump water gun. 5,150,819, Cl. 222-79.000.
Johnson, Tod S.: *See*—
Miller, Charles R.; Berry, Haskell B., Jr.; and Johnson, Tod S., 5,150,843, Cl. 241-27.000.
Johnson, Tom W.: *See*—
Baxi, Indra R.; and Johnson, Tom W., 5,151,278, Cl. 425-130.000.
Johnston, Thomas F.: *See*—
Perilloux, Bruce; Bloom, Arnold; Fischer, Dennis; Giammona, Larry; and Johnston, Thomas F., 5,151,917, Cl. 372-102.000.
Johten, Kazuhiro: *See*—
Wakita, Naohide; Iwai, Yoshio; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Johten, Kazuhiro; Kimura, Satoshi; and Fujiwara, Shozo, 5,151,803, Cl. 359-56.000.
Joly, Jean-Francois: *See*—
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Jomac, Inc.: *See*—
Nishiwaki, Hiroshi, 5,150,738, Cl. 139-420.00R.
Jones, Brian W.: *See*—
Pearson, Ronald W.; and Jones, Brian W., 5,151,644, Cl. 320-14.000.
Jones, Harold C.: *See*—
Wackrow, Roger D.; White, Kenneth W.; and Jones, Harold C., 5,150,701, Cl. 124-67.000.
Jones, Irby W.: *See*—
Holloway, Sidney E., III; Crossley, Edward A., Jr.; Jones, Irby W.; Miller, James B.; Davis, C. Calvin; Behun, Vaughn D.; and Goodrich, Lewis R., Sr., 5,150,875, Cl. 248-550.000.
Jones, Nelson: *See*—
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, 5,150,748, Cl. 165-41.000.
Jones, Richard E.: *See*—
Hwang-Felgner, Jiin-Yu; Jones, Richard E.; and Maher, James F., 5,151,265, Cl. 424-85.500.
Jonkman, Kenneth R., to DLP, Inc. Aortic root cannula. 5,151,087, Cl. 604-164.000.
Jordan, Robert E.; and Hughes, Michael J., to B. F. Goodrich Company, The. Reactor vessel. 5,150,831, Cl. 228-184.000.
Jordhamo, George M.: *See*—
Galyon, George T.; Jordhamo, George M.; and Wirtz, Louis H., 5,151,169, Cl. 205-151.000.
Joseph, Daniel D.; and Hultman, Dave A., to Joseph, Daniel D. Spinning drop tensioextensiometer. 5,150,607, Cl. 73-64.480.
Joshi, Sharad H.: *See*—
Abele, John E.; Lennox, Charles E.; Nardella, Paul C.; and Joshi, Sharad H., 5,151,100, Cl. 606-28.000.
Josquin, Wilhelmus J. M. J.; Peters, Wilhelmus C. M.; and Van De Goor, Albertus T. M., to U.S. Philips Corp. Method of manufacturing a semiconductor device by maskless pn junction isolation means. 5,151,382, Cl. 437-74.000.
Jousselin, Christian P. M.; and Duranton, Marc A. G., to U.S. Philips Corporation. Arrangement of data cells and neural network system utilizing such an arrangement. 5,151,971, Cl. 395-27.000.
JPE Co., Ltd.: *See*—
Kumaki, Tuneo; Nagase, Toshikatu; and Shichijo, Yasuhisa, 5,150,649, Cl. 101-365.000.
Jugle, Kip L.: *See*—
Lundy, Douglas A.; Jugle, Kip L.; MacDonald, Daniel W.; Berman, Robin E.; and Hurwitch, Carl B., 5,151,744, Cl. 355-296.000.
Jun, Taue, to Yamaha Hatsudoki Kabushiki Kaisha. High pressure fuel injection unit for engine. 5,150,684, Cl. 123-446.000.
Juridical Foundation the Chemo-Sero-Therapeutic Research Institute: *See*—
Kuzuhara, Syoji; Odo, Koichi; and Mizuno, Kyosuke, 5,151,023, Cl. 424-89.000.
Kabasin, Daniel F.; and Stoltman, Donald D., to General Motors Corporation. Adaptive memory control for normalized dilution. 5,150,696, Cl. 123-571.000.
Kabushiki Kaisha Goto Seisakusho: *See*—
Hirakawa, Tadao; Tamura, Sachio; and Sasanami, Hiromitsu, 5,151,118, Cl. 65-18.100.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Yutori, Toshiaki; and Kanetsuki, Yutaka, 5,151,653, Cl. 324-158.00P.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kitabayashi, Hiroyuki; and Ishikawa, Tadayuki, 5,151,109, Cl. 51-297.000.
Kabushiki Kaisha Matsui Seisakusho: *See*—
Morimoto, Kiyoshi; Iwamoto, Akikazu; Shimizu, Masahiko; Miwa, Teiichi; and Murata, Kazue, 5,150,990, Cl. 406-50.000.
Kabushiki Kaisha Meidensha: *See*—
Fushimi, Kazuo; Kitakizaki, Kaoru; and Kawakami, Kazuhiko, 5,151,334, Cl. 429-32.000.
Kabushiki Kaisha Nihon Pipe Conveyor Kenkyusho: *See*—
Hashimoto, Kunio, 5,150,783, Cl. 198-819.000.
Kabushiki Kaisha Pilot: *See*—
Igawa, Tatsuya, 5,151,032, Cl. 434-409.000.
Kabushiki Kaisha Sangi: *See*—
Atsumi, Kiminori; Saito, Tomoki; and Komori, Masaaki, 5,151,122, Cl. 106-35.000.
Kabushiki Kaisha Shinkosha: *See*—
Ohta, Hiroshi; and Nakamura, Noriyuki, 5,151,955, Cl. 385-6.000.
Kabushiki Kaisha Top: *See*—
Sugita, Koichi, 5,150,823, Cl. 222-386.000.
Kabushiki Kaisha Toshiba: *See*—
Fujimoto, Hitoshi, 5,151,740, Cl. 355-246.000.
Fujiwara, Takayoshi; and Honma, Hisanori, 5,151,021, Cl. 418-93.000.
Gotou, Yukifumi, 5,150,582, Cl. 62-155.000.
Ishibashi, Yoriyuki; Hirano, Ryoichi; and Nishida, Jun, 5,151,754, Cl. 356-356.000.
Nagae, Akihito, 5,151,992, Cl. 395-750.000.
Nosaki, Takefumi; and Sasama, Kazuo, 5,151,797, Cl. 358-474.000.
Ohmine, Toshimitsu; Akagawa, Keiichi; and Ishihata, Akira, 5,151,133, Cl. 118-725.000.
Okazaki, Kiyoshi, 5,150,713, Cl. 128-660.030.
Sato, Mitsuo; Shaura, Hazime; and Tateishi, Megumi, 5,151,276, Cl. 425-110.000.
Shimizu, Yasuhiko, 5,150,828, Cl. 228-102.000.
Suzuki, Shohei; and Sakuma, Isao, 5,151,982, Cl. 395-425.000.
Takebuchi, Masataka, 5,151,761, Cl. 357-23.500.
Tanaka, Kuniyoshi; Shirouzu, Shunji; Ohta, Minoru; and Miyagawa, Hideo, 5,151,659, Cl. 324-458.000.
Tatara, Shinji; and Okayasu, Masami, 5,151,853, Cl. 363-160.000.
Terashi, Kozo; and Oba, Toshio, 5,151,931, Cl. 378-65.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Mori, Tatsushi; Kobayashi, Hisao; and Izumi, Yuji, 5,151,020, Cl. 418-55.200.
Kabushiki Kaisha Yamada Corp.: *See*—
Saita, Seiji, 5,150,643, Cl. 91-229.000.
K.K. Ueno Seiyaku Oyo Kenkyujo: *See*—
Ueno, Ryuzo; Ueno, Ryuji; and Oda, Tomio, 5,151,444, Cl. 514-530.000.
Kabushiku Kasisha Ogura: *See*—
Kimura, Kiyoshi, 5,150,644, Cl. 91-395.000.
Kabuto, Nobuaki; Igarashi, Mayumi; Inoue, Fumio; and Ando, Kunio, to Hitachi, Ltd. Display device with matrix-arranged pixels having reduced number of vertical signal lines. 5,151,689, Cl. 340-784.000.
Kaczmarek, James S.; and Steimel, James M. Method of calibrating a rotary tool unit for an assembly line. 5,150,624, Cl. 73-865.900.
Kaden, Milton E. Extensible interjoist hanger support assembly. 5,150,368, Cl. 248-343.000.
Kado, Makoto: *See*—
Shiraki, Tatsuya; and Kado, Makoto, 5,151,975, Cl. 395-153.000.
Kadohara, Terutake: *See*—
Akashi, Akira; and Kadohara, Terutake, 5,151,732, Cl. 354-402.000.
Kady, Mark A.: *See*—
Marrah, Jeffrey J.; Manlove, Gregory J.; Kennedy, Richard A.; and Kady, Mark A., 5,151,939, Cl. 381-15.000.
Kaeufe, Helmut; and Kipfelsberger, Christian, to RXS Schrumpftechnik-Garnituren GmbH. Method for manufacturing heat-activatable articles. 5,151,152, Cl. 156-645.000.
Kagayama, Toshi: *See*—
Iwasaki, Shuji; Kagayama, Toshi; and Kamata, Kazuya, 5,150,821, Cl. 222-132.000.
Kai, Takashi: *See*—
Arahara, Kohzoh; Yuasa, Toshiya; Kai, Takashi; Tohyama, Noboru; Mouri, Akihiro; and Matsumoto, Kenichi, 5,151,712, Cl. 346-1.100.
Kaiser, Lutz; Kimmerle, Eugen; Mirbach, Erich; and Notter, Frank, to International Business Machines Corporation. Device for connecting and disconnecting first and second electrical connector parts. 5,151,041, Cl. 439-157.000.
Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, to Hitachi, Ltd. Apparatus and method for controlling a washing machine. 5,150,489, Cl. 8-159.000.
Kajigaya, Kazuhiko; and Sawada, Jiro, to Hitachi, Ltd. Semiconductor memory including an arrangement to permit external monitoring of an internal control signal. 5,151,881, Cl. 365-233.000.
Kajita, Yusuke: *See*—
Hirata, Toichi; Tanaka, Hideaki; Sugiyama, Genroku; and Kajita, Yusuke, 5,150,574, Cl. 60-465.000.
Kakubari, Zen-ichi: *See*—
Tanaka, Ichiro; Sasaki, Seiji; Kakubari, Zen-ichi; and Kojima, Osamu, 5,151,063, Cl. 454-258.000.
Kakuishi, Mitsuo: *See*—
Chujo, Kaoru; Kakuishi, Mitsuo; and Fukui, Hirokazu, 5,151,937, Cl. 379-410.000.
Kakutani, Toshiaki; Yanase, Nobuyuki; Fukushima, Hitoshi; and Takahata, Toshiya, to Seiko Epson Corporation. Electrophoretic imaging device. 5,151,741, Cl. 355-257.000.
Kamamori, Hitoshi: *See*—
Suginoya, Mitsuru; Kamamori, Hitoshi; and Fukuchi, Takakazu, 5,151,379, Cl. 427-39.000.
Kamata, Kazuya: *See*—
Iwasaki, Shuji; Kagayama, Toshi; and Kamata, Kazuya, 5,150,821, Cl. 222-132.000.

Kamen, Melvin E.; and Bernstein, Philip, to Revlon, Inc. Cosmetic color display apparatus and methods. 5,150,791, Cl. 206-457.000.

Kameswaran, Venkataraman; and Barton, Jerry M., to American Cyanamid Company. Process for the manufacture of pesticidal 1-(alkoxymethyl) pyrrole compounds. 5,151,536, Cl. 548-530.000.

Kameyama, Shoju; Miyano, Kenmi; Hashimoto, Motonori; Takechi, Kazuo; Ohmura, Takao; Hirao, Yutaka; Uemura, Yahiro; and Yokoyama, Kazumasa, to Green Cross Corporation, The. Production method for protein-containing composition. 5,151,499, Cl. 530-381.000.

Kamikawai, Ryotaro: *See*—
Goto, Eiichi; Hioe, Willy; Hosoya, Mutsumi; and Kamikawai, Ryotaro, 5,151,617, Cl. 307-462.000.

Kamiya, Saburo: *See*—
Tanimoto, Akikazu; and Kamiya, Saburo, 5,151,749, Cl. 356-375.000.

Kamiyama, Hiroyasu; and Amino, Hirokazu, to Kyocera Corporation; and Kamiyama, Hiroyasu. Blood vessel coagulation/stanching device. 5,151,102, Cl. 606-51.000.

Kammerer, Gerd: *See*—
Blessing, Andreas; Griss, Jochen; and Kammerer, Gerd, 5,151,865, Cl. 364-483.000.

Kanamori, Hideto: *See*—
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.

Kanari, Masayuki: *See*—
Takada, Kazuaki; Kanari, Masayuki; Yajima, Makoto; and Toyoda, Eiji, 5,151,637, Cl. 318-376.000.

Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, to Nippon Hoso Kyokai. Signal transmission system for high definition television. 5,151,779, Cl. 358-12.000.

Kanbar, Maurice S. Convertible swizzle stick. 5,151,720, Cl. 351-46.000.

Kanebo, Ltd.: *See*—
Asano, Koin; Tagawa, Kenichi; Nakagawa, Hiroshi; and Wakahara, Hiroyuki, 5,151,240, Cl. 264-284.000.

Kaneko, Satoshi, to Tokyo Electron Limited. Treatment system having gate device for decompression chamber. 5,150,882, Cl. 251-193.000.

Kanemitsu, Shinji, to Canon Kabushiki Kaisha. Recording apparatus for compensating for eccentricities in drive force transmission means. 5,151,716, Cl. 346-140.00R.

Kanemori, Yuzuru: *See*—
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000.

Kanetsuki, Yutaka: *See*—
Yutori, Toshiaki; and Kanetsuki, Yutaka, 5,151,653, Cl. 324-158.00P.

Kanoh, Masaaki: *See*—
Matsuzawa, Akira; Kanoh, Masaaki; and Tada, Shoichiro, 5,151,700, Cl. 341-156.000.

Kao, Jamee; and Hsu, Joseph C. S. Pleating machine for dual fluted shade. 5,151,151, Cl. 156-471.000.

Kaptein, Dick, to Fokker Aircraft B.C. Propeller blade position controller. 5,150,855, Cl. 244-1.00N.

Karasawa, Haruo: *See*—
Nagatsuka, Sumiya; Takeuchi, Hiroshi; and Karasawa, Haruo, 5,151,947, Cl. 382-6.000.

Kardorff, Uwe: *See*—
Mueller, Stefan; Theobald, Hans; Wolf, Bernd; Hofmeister, Peter; Kardorff, Uwe; and Kuenast, Christoph, 5,151,441, Cl. 514-378.000.

Karjalainen, Sari: *See*—
Osterholm, Jan-Erik; Laakso, Jukka; Karjalainen, Sari; and Mononen, Pirjo, 5,151,221, Cl. 252-500.000.

Karl Mayer Textilmaschinenfabrik: *See*—
Bergmann, Gerhard, 5,150,587, Cl. 66-195.000.

Karlsson, Hans A.: *See*—
Strid, Kent; Karlsson, Hans A.; and Larsson, Per, 5,151,176, Cl. 210-178.000.

Karpisek, Ladislav S. Support for a hose for filling liquid into a container. 5,150,866, Cl. 248-79.000.

Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, to Hitachi, Ltd.; and Sanwa Electronics Instrument Co., Ltd. Multi-function keyboard for remote control apparatus. 5,151,696, Cl. 341-22.000.

Kasai, Takao: *See*—
Wakasugi, Makoto; and Kasai, Takao, 5,151,837, Cl. 360-103.000.

Kasuo, Tomoo, to Casio Computer Co., Ltd. Stopwatch. 5,151,885, Cl. 368-110.000.

Katahata, Toshio: *See*—
Aoki, Hiroyuki; Suzuki, Tadashi; Katahata, Toshio; Haino, Mutsuo; Nishimura, Genshiro; Kaya, Hiroshi; Tamura, Kozaburo; and Isoda, Takeshi, 5,151,390, Cl. 501-95.000.

Kataoka, Junnosuke: *See*—
Sakamoto, Masahiro; and Kataoka, Junnosuke, 5,151,640, Cl. 318-696.000.

Katayama, Hideaki: *See*—
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.

Katayama, Katsuhiro: *See*—
Kuroiwa, Katsumasa; Katayama, Katsuhiro; Miura, Toshihide; and Nagasawa, Takeshi, 5,151,372, Cl. 436-164.000.

Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, to Sharp Kabushiki Kaisha. Active matrix substrate and active matrix display apparatus. 5,151,807, Cl. 359-59.000.

Kato, Hiroaki: *See*—
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000.

Kato, Hisakazu: *See*—
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

Kato, Hisao: *See*—
Fujita, Akira; and Kato, Hisao, 5,151,562, Cl. 187-134.000.

Kato, Kazuo: *See*—
Inaba, Hitoshi; Nishijima, Kazumi; Kato, Kazuo; Yamamoto, Ichiro; Mochida, Ei; and Ohtomo, Kikuo, 5,151,431, Cl. 514-292.000.

Kato, Noriko: *See*—
Ozawa, Ryutaro; Hayakawa, Tomoya; Kato, Noriko; Kobayashi, Soichi; and Fuse, Seisaku, 5,151,289, Cl. 426-557.000.

Kato, Shinichiro: *See*—
Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, 5,150,924, Cl. 285-101.000.
Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, 5,150,925, Cl. 285-101.000.

Kato, Takeshi: *See*—
Ohya, Hiroshi; and Kato, Takeshi, 5,150,923, Cl. 285-21.000.
Sasaki, Akira; Kato, Takeshi; and Hakoyama, Akiyoshi, 5,151,973, Cl. 395-109.000.

Kato, Toshikazu: *See*—
Inoue, Hiroshi; Kato, Toshikazu; and Ogawara, Kensuke, 5,151,495, Cl. 528-388.000.

Kato, Yasuyoshi; Konishi, Kunihiko; Teshima, Nobue; Matsuda, Toshiaki; and Akama, Hiroshi, to Babcock-Hitachi Kabushiki Kaisha. Coal combustion apparatus provided with a denitration. 5,151,256, Cl. 423-210.000.

Kato, Yuji: *See*—
Shimanaka, Shigeki; and Kato, Yuji, 5,150,761, Cl. 180-197.000.

Kato, Yuuichi: *See*—
Ohnaka, Hidemi; Tanaka, Masaaki; Kato, Yuuichi; Furuhashi, Michio; Satoya, Koichi; and Ooi, Yasuhiro, 5,150,693, Cl. 123-559.300.

Katraro, Reuven: *See*—
Perry, Mordechai; Yacubowicz, Henia; Linder, Charles; Nemas, Mara; and Katraro, Reuven, 5,151,182, Cl. 210-500.270.

Katritzky, Alan: *See*—
Vaughn, Stephen N.; Siskin, Michael; Katritzky, Alan; Brons, Glen; Reynolds, Steve N.; Culross, Claude C.; and Neskora, Dan R., 5,151,173, Cl. 208-430.000.

Katsnelson, Inessa: *See*—
Hu, Ho-Pin; Katsnelson, Inessa; and Sellinger, Alan, 5,151,189, Cl. 210-635.000.

Katsu, Kanemasa: *See*—
Sasho, Manabu; Yamauchi, Hiroshi; Yamanaka, Motosuke; Nakamura, Takaharu; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; and Negi, Shigeto, 5,151,417, Cl. 514-202.000.

Kawabata, Atsushi: *See*—
Tani, Masayuki; Nakanishi, Kunio; Kawabata, Atsushi; Watanabe, Norito; Yokoyama, Takanori; and Tanifuji, Shinya, 5,151,974, Cl. 395-128.000.

Kawabata, Kazunobu, to Nissan Motor Company, Limited. Active suspension system with control to change variation in pressure of working fluid cylinder between increase and decrease thereof. 5,150,917, Cl. 280-707.000.

Kawada, Shozo: *See*—
Nakano, Hirofumi; Kawada, Shozo; Uosaki, Yoichi; Saito, Yutaka; Gomi, Katsushige; and Iwazaki, Toshiaki, 5,151,352, Cl. 435-123.000.

Kawaguchi, Akira; Suzuki, Tatsuyuki; and Yoshida, Michihito, to Mitsubishi Materials Corporation. Apparatus for rotating top ends of cans. 5,151,001, Cl. 414-225.000.

Kawaguchi, Hideo; Takeuchi, Kouji; Ishibashi, Tadashi; Shimizu, Norio; and Odawara, Yoji, to Hitachi, Ltd. Apparatus containing a septum which impedes cell permeation for cell culture and method of use. 5,151,362, Cl. 435-240.250.

Kawahara, Katsumi; Uchida, Masami; Yoshioka, Kazumi; Ohta, Takeo; and Horai, Keiichiro, to Matsushita Electric Industrial Co., Ltd. Process for manufacturing an optical recording medium. 5,151,295, Cl. 427-12.000.

Kawahara, Setsuko; Nakano, Yasushi; and Koyama, Noboru, to Konica Corporation. Magnetic recording medium and manufacturing method thereof. 5,151,323, Cl. 428-323.000.

Kawahara, Yoji: *See*—
Fukuda, Nobuhiro; Kobayashi, Sadao; Miyachi, Kenji; Takenouchi, Hidemi; Kawahara, Yoji; and Teramoto, Takayuki, 5,151,255, Cl. 422-186.050.

Kawahara, Yukito: *See*—
Machida, Satoshi; Kawahara, Yukito; and Mukainakano, Hiroshi, 5,151,587, Cl. 250-208.100.

Kawai, Makoto: *See*—
Arai, Hideki; Kawai, Makoto; and Miyai, Kenji, 5,151,254, Cl. 422-180.000.
Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshiro, to Hirose Electric Co., Ltd. Electrical connector. 5,151,033, Cl. 439-95.000.
Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshihiro, to Hirose Electric Co., Ltd. Electrical connector. 5,151,035, Cl. 439-95.000.
Kawakami, Kazuhiko: *See*—
Fushimi, Kazuo; Kitakizaki, Kaoru; and Kawakami, Kazuhiko, 5,151,334, Cl. 429-32.000.
Kawamoto, Mutsumi: *See*—
Yamashita, Mitugu; Kawamoto, Mutsumi; and Inagaki, Hidemitsu, 5,150,763, Cl. 180-252.000.
Kawamoto, Satoru; Nakagawa, Noaki; and Hayama, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Liquid crystal display apparatus having a series combination of the storage capacitors. 5,151,806, Cl. 359-59.000.
Kawamoto, Sigeharu, to Matsushita Electric Industrial Co., Ltd. Field decision correction apparatus. 5,151,786, Cl. 358-148.000.
Kawanishi, Syun-ichi: *See*—
Washio, Masakazu; and Kawanishi, Syun-ichi, 5,151,486, Cl. 528-124.000.
Kawasaki, Keiichi; Ohkoda, Keiji; Kudo, Tomohiro; and Shimizu, Satoshi, to Cannon Kabushiki Kaisha. Image recording apparatus. 5,151,713, Cl. 346-108.000.
Kawasaki, Moriyoshi: *See*—
Nakase, Kazuhiko; and Kawasaki, Moriyoshi, 5,151,708, Cl. 343-722.000.
Kaya, Hiroshi: *See*—
Aoki, Hiroyuki; Suzuki, Tadashi; Katahata, Toshio; Haino, Mutsuo; Nishimura, Genshiro; Kaya, Hiroshi; Tamura, Kozaburo; and Isoda, Takeshi, 5,151,390, Cl. 501-95.000.
Kazerounian, Reza; Eitan, Boaz; and Irani, Rustom F., to Waferscale Integration, Inc. EPROM virtual ground array. 5,151,375, Cl. 437-43.000.
Kearns, Kevin J.: *See*—
Kelley, Richard L.; Pham, Thuan N.; and Kearns, Kevin J., 5,150,785, Cl. 206-217.000.
Keene, Donna L.: *See*—
Shah, Bakulesh N.; Tran, Dung Q.; and Keene, Donna L., 5,151,546, Cl. 560-130.000.
Kel Corporation: *See*—
Tanaka, Mitsuho, 5,151,040, Cl. 439-73.000.
Kelkar, Krishnanand: *See*—
Reiner, Thomas C.; Lindsey, Mark J.; and Kelkar, Krishnanand, 5,151,904, Cl. 371-43.000.
Kelley, Richard L.; Pham, Thuan N.; and Kearns, Kevin J. Storage container. 5,150,785, Cl. 206-217.000.
Kelly, Timothy J.: *See*—
Harasin, Stephen J.; Sounik, David F.; and Kelly, Timothy J., 5,151,483, Cl. 528-44.000.
Kelly, William E.: *See*—
El-Hibri, Mohammad J.; Jack, Gregory S.; Kelly, William E.; and Patel, Sanjay R., 5,151,462, Cl. 524-405.000.
Kelston, Henry J. Squeeze resistant carton holder. 5,150,811, Cl. 220-411.000.
Kemp, David B.; McCormick, Christopher P.; and Fraser, Mark D., to Eastman Kodak Company. Film cassette. 5,151,730, Cl. 354-275.000.
Kempf, Dale J.: *See*—
Sham, Hing L.; Norbeck, Daniel W.; Kempf, Dale J.; and Zhao, Chen, 5,151,438, Cl. 514-357.000.
Kenna, Robert V., to Pfizer Hospital Products Group, Inc. Self-locking joint connector. 5,151,104, Cl. 606-73.000.
Kennedy, John W., to York Products Inc. Fastener for truck bed liner. 5,150,940, Cl. 296-39.200.
Kennedy, Richard A.: *See*—
Marrah, Jeffrey J.; Manlove, Gregory J.; Kennedy, Richard A.; and Kady, Mark A., 5,151,939, Cl. 381-15.000.
Kenney, Glen E.: *See*—
Tees, Alistair A.; and Kenney, Glen E., 5,151,111, Cl. 55-164.000.
Kent, Carole L.; and Frank, Dieter, to Kent, Carole L. Method for maintaining the integrity of hosiery. 5,151,302, Cl. 427-140.000.
"Keramag" Keramischewerke AG: *See*—
Egli, Anton, 5,150,926, Cl. 285-110.000.
Kessler, David: *See*—
Blanding, Douglass L.; Harrigan, Michael E.; and Kessler, David, 5,151,810, Cl. 359-198.000.
Key, Sally M.: *See*—
Alvarez, Vincent H.; and Dendramis, Nancy C., 5,150,824, Cl. 224-151.000.
Keystone Rustproofing, Inc.: *See*—
Meglio, William J., 5,150,531, Cl. 34-11.000.
Khachab, Nabil I.: *See*—
Zarabadi, Seyed R.; El-Naggar, Mohammed I.; and Khachab, Nabil I., 5,151,625, Cl. 307-529.000.
Khalid, Hecham R.: *See*—
Myslicki, Robert J.; Khalid, Hecham R.; and Aubry, Michael E., 5,150,933, Cl. 292-216.000.
Khanna, Ish: *See*—
Behling, James R.; Farid, Payman; Khanna, Ish; Medich, John R.; Prunier, Mike; Scaros, Mike G.; and Weier, Richard M., 5,151,519, Cl. 546-219.000.
Khek, Sokhuom, to Fibra-Sonics, Inc. Ultrasonic needle with sleeve that includes a baffle. 5,151,084, Cl. 604-22.000.
Khoury, Adib I., to Angiolaz, Incorporated. Laser catheter diffuser. 5,151,096, Cl. 606-15.000.
Kida, Shigeru; and Sakai, Katsuyuki, to Sharp Kabushiki Kaisha. Power switching apparatus with power switching timing. 5,150,630, Cl. 74-354.000.
Kidd, Dennis R., to Phillips Petroleum Company. Removal of hydrogen sulfide from fluid streams. 5,151,257, Cl. 423-230.000.
Kidd, Dennis R.: *See*—
Schubert, Paul F.; Kubicek, Donald H.; and Kidd, Dennis R., 5,151,401, Cl. 502-329.000.
Kikiuis, Dan. Dynamic holographic display with cantilever. 5,151,724, Cl. 357-17.000.
Kim, Jong-Hae, to Samsung Electronics Co., Ltd. FM modulator for compensating modulation characteristics on each channel. 5,151,668, Cl. 332-124.000.
Kim, Son N. Radiation-sensitive mixture and production of relief structures. 5,151,341, Cl. 430-270.000.
Kimberly-Clark Corporation: *See*—
Reeves, William G.; Powers, Michael D.; Mathis, Michael P.; and Duello, Leonard E., 5,151,321, Cl. 428-286.000.
Kiminami, Kazuhiro: *See*—
Ishihara, Makoto; Kiminami, Kazuhiro; Wakabayashi, Masakazu; Hori, Hirokazu; Tatsu, Saneharu; and Takeshita, Sachio, 5,151,234, Cl. 264-176.100.
Kimizuka, Junichi: *See*—
Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori; and Ito, Toshiyuki, 5,151,910, Cl. 372-31.000.
Kimmerle, Eugen: *See*—
Kaiser, Lutz; Kimmerle, Eugen; Mirbach, Erich; and Notter, Frank, 5,151,041, Cl. 439-157.000.
Kimoto Co., Ltd.: *See*—
Yokosuka, Toshie, 5,151,336, Cl. 430-7.000.
Kimoto, Yukitane; Murata, Kohzou; and Muraki, Toshio, to Toray Industries, Inc. Thermoplastic composite plate material and products molded from the same. 5,151,322, Cl. 428-303.000.
Kimura, Hiroshi. Method for making resin dental plates and flasks. 5,151,279, Cl. 425-178.000.
Kimura, Katsutaka: *See*—
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000.
Kimura, Kiyoshi, to Kabushiku Kasisha Ogura. Release valve mechanism in a fluid operated linear actuator for a portable cutter or the like. 5,150,644, Cl. 91-395.000.
Kimura, Satoshi: *See*—
Wakita, Naohide; Iwai, Yoshio; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Johten, Kazuhiro; Kimura, Satoshi; and Fujiwara, Shozo, 5,151,803, Cl. 359-56.000.
Kimura, Shigeaki: *See*—
Suzuki, Aimi; Azuma, Toshiaki; Kimura, Shigeaki; and Hosogi, Yasuyuki, 5,151,404, Cl. 503-200.000.
Kimura, Tomoaki: *See*—
Sekiya, Teruo; Kimura, Tomoaki; and Nishimura, Sadao, 5,150,597, Cl. 72-229.000.
Kimura, Yasuo, to NEC Corporation. Optical head device for optimally detecting a focussing error. 5,151,892, Cl. 369-109.000.
Kimura, Yukihiro: *See*—
Takai, Kazuhito; and Kimura, Yukihiro, 5,151,954, Cl. 382-41.000.
King, Brian: *See*—
Clements, Stephen; and King, Brian, 5,151,119, Cl. 65-84.000.
King, Jerry W.: *See*—
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King, Lloyd H., Jr., to King Technology of Missouri Inc. Method of making a wire junction encapsulating wire connector. 5,151,239, Cl. 264-272.110.
King, Randal D.: *See*—
Montgomery, Eda R.; and King, Randal D., 5,151,170, Cl. 205-298.000.
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Allen, James D.; and King, Steven A., 5,151,990, Cl. 395-650.000.
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King, Lloyd H., Jr., 5,151,239, Cl. 264-272.110.
Kingman, John E. E., to Atlantic Richfield Company. Method for deconvolution of non-ideal frequency response of pipe structures to acoustic signals. 5,151,882, Cl. 367-82.000.
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Hunt, Rodney J.; and Kip, Ruloff F., Jr., 5,150,852, Cl. 242-157.00R.
Kipfelsberger, Christian: *See*—
Kaeufe, Helmut; and Kipfelsberger, Christian, 5,151,152, Cl. 156-645.000.
Kirby, John S.: *See*—
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, 5,150,748, Cl. 165-41.000.
Kiri, Motosada; and Adachi, Susumu, to Shimadzu Corporation. Radiation imaging apparatus having detection elements of varying sizes. 5,151,588, Cl. 250-208.100.
Kirk, Christopher P., to Pet Mate Limited. Dispensing device. 5,150,664, Cl. 119-51.120.
Kirk, William D., III; DeCaro, Anthony A.; and Perry, Wayne E. Retractable protective needle sheath. 5,151,089, Cl. 604-192.000.
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Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000.

Kisida, Hirosi: *See—*
Sakamoto, Noriyasu; Kisida, Hirosi; Fujimoto, Hiroaki; Umeda, Kimitoshi; and Matsuo, Noritada, 5,151,428, Cl. 514-277.000.

Kitabayashi, Hiroyuki; and Ishikawa, Tadayuki, to Kabushiki Kaisha Komatsu Seisakusho. Grinder and method of manufacturing the same. 5,151,109, Cl. 51-297.000.

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Watanabe, Toshiya; and Kitabayashi, Tetsuo, 5,151,845, Cl. 361-234.000.

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Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000.

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Fushimi, Kazuo; Kitakizaki, Kaoru; and Kawakami, Kazuhiko, 5,151,334, Cl. 429-32.000.

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Kitamura, Tohru: *See—*
Koden, Mitsuhiro; Kuratate, Tomoaki; Funada, Fumiaki; Sakaguchi, Kazuhiko; and Kitamura, Tohru, 5,151,214, Cl. 252-299.610.

Kitaue, Kazumi, to Konami Co., Ltd. Hand held video game with simulated rescue. 5,150,899, Cl. 273-85.00G.

Kitazato, Keisuke: *See—*
Sunaoka, Yoshio; Kitazato, Keisuke; and Tsuda, Satoru, 5,151,191, Cl. 210-644.000.

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Andersen, Paul G.; and Kite-Powell, Kai L., 5,151,026, Cl. 425-204.000.

Kivisto, Tuomo V. J.: *See—*
Marttila, Tom E.; Kivisto, Tuomo V. J.; and Ahola, Pentti V., 5,151,006, Cl. 414-626.000.

Klaus, Thomas R., to Motorola, Inc. Receiver controller method and apparatus. 5,152,006, Cl. 455-89.000.

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Elias, Samir F.; Klausmeyer, Kevin; and Holland, Kurt, 5,151,456, Cl. 524-60.000.

Kleine-Onnibrink, Bernhard: *See—*
Biehl, Wilfried; and Kleine-Onnibrink, Bernhard, 5,151,675, Cl. 335-78.000.

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Brevick, John E.; Bittner, Steven P.; and Kling, Briant J., 5,150,676, Cl. 123-195.00R.

Klinkner, Walter: *See—*
Leiber, Heinz; Steiner, Manfred; and Klinkner, Walter, 5,150,951, Cl. 303-100.000.

Kluth, Joachim: *See—*
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000.

Knepper, Jonathan D.; and Moll, Kenneth P., to AT&T Bell Laboratories. Apparatus for holding samples during solderability testing. 5,150,829, Cl. 228-104.000.

Knights, Douglas S., to B & R Electrical PLC. Electrical safety apparatus. 5,151,841, Cl. 361-86.000.

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Perenyi, Andras; Utpal, Goswami; Arato, Mihaly; Frescka, Ede; Knoll, Jozsef; and Bela, D. Arpad, 5,151,419, Cl. 514-226.200.

Knorr Brake Holding Corporation: *See—*
Lumbis, Anthony W., 5,151,055, Cl. 439-784.000.

Knoster, Richard G. Gun sighting arbor. 5,150,527, Cl. 33-234.000.

Kobayashi, Hisao: *See—*
Mori, Tatsushi; Kobayashi, Hisao; and Izumi, Yuji, 5,151,020, Cl. 418-55.200.

Kobayashi, Michihito: *See—*
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.

Kobayashi, Noboru, to Yamaha Hatsudoki Kabushiki Kaisha. Signal device for small boat. 5,150,663, Cl. 116-209.000.

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Kobayashi, Sadao: *See—*
Fukuda, Nobuhiro; Kobayashi, Sadao; Miyachi, Kenji; Takenouchi, Hidemi; Kawahara, Yoji; and Teramoto, Takayuki, 5,151,255, Cl. 422-186.050.

Kobayashi, Satomi: *See—*
Moriyama, Yoshiaki; and Kobayashi, Satomi, 5,151,791, Cl. 358-261.200.

Kobayashi, Soichi: *See—*
Ozawa, Ryutaro; Hayakawa, Tomoya; Kato, Noriko; Kobayashi, Soichi; and Fuse, Seisaku, 5,151,289, Cl. 426-557.000.

Kobayashi, Toshiaki: *See—*
Hayashi, Teruyuki; Kobayashi, Toshiaki; and Tanaka, Masato, 5,151,538, Cl. 556-431.000.

Kobayashi, Tsutomu; and Kojima, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Shift lever device for automatic transmission. 5,150,593, Cl. 70-248.000.

Koblinski, Brian D.: *See—*
Croft, Alan P.; and Koblinski, Brian D., 5,151,130, Cl. 106-778.000.

Koch Industries, Inc.: *See—*
Elias, Samir F.; Klausmeyer, Kevin; and Holland, Kurt, 5,151,456, Cl. 524-60.000.

Kocher, Haribhajan S.: *See—*
Devaney, Mark J., Jr.; Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribhajan S.; and Wagner, Paul W., 5,150,955, Cl. 354-321.000.

Koden, Mitsuhiro; Kuratate, Tomoaki; Funada, Fumiaki; Sakaguchi, Kazuhiko; and Kitamura, Tohru, to Sharp Kabushiki Kaisha. Ferroelectric liquid crystal device. 5,151,214, Cl. 252-299.610.

Koenig, Josef: *See—*
Gaeng, Manfred; Saukel, Heinz; Hoffmann, Wolfgang; and Koenig, Josef, 5,151,523, Cl. 548-217.000.

Kofsky, Irving L.; and Trowbridge, Christian A., to United States of America, Navy. Optical tracking of charged particle beams. 5,151,746, Cl. 356-1.000.

Kohda, Katsuhiro; and Matsuda, Terumi, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 5,151,604, Cl. 250-484.100.

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Kohn, Joshua L.: *See—*
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Kohn, Matthew O.: *See—*
Gould, Murray J.; Kohn, Joshua L.; and Kohn, Matthew O., 5,150,869, Cl. 248-346.100.

Koide, Tomoyuki; Matsuda, Naoto; Nakamura, Koki; and Kojima, Tetsuro, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,151,357, Cl. 430-610.000.

Koike, Shouji: *See—*
Fukushima, Kyouko; Shirota, Koromo; and Koike, Shouji, 5,151,128, Cl. 106-20.000.

Koito Manufacturing Co., Ltd.: *See—*
Miyazawa, Kenji; and Terao, Hidetoshi, 5,150,958, Cl. 362-66.000.
Oda, Goichi; Toda, Atsushi; Yagi, Soichi; and Shibata, Hiroki, 5,151,631, Cl. 315-127.000.

Koizumi, Satoru, to Sharp Kabushiki Kaisha. Brake releasing mechanism of duplex tape recorder. 5,151,834, Cl. 360-92.000.

Koizumi, Satoru: *See—*
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

Kojima, Kazuo: *See—*
Kobayashi, Tsutomu; and Kojima, Kazuo, 5,150,593, Cl. 70-248.000.

Kojima, Naoto: *See—*
Sakata, Matsumi; Kumura, Tatsuo; Suzuki, Atsushi; Ikeda, Yoshito; Aoki, Kaoru; Kojima, Naoto; and Mishima, Akio, 5,150,511, Cl. 29-603.000.

Kojima, Osamu: *See—*
Tanaka, Ichiro; Sasaki, Seiji; Kakubari, Zen-ichi; and Kojima, Osamu, 5,151,063, Cl. 454-258.000.

Kojima, Tetsuro: *See—*
Koide, Tomoyuki; Matsuda, Naoto; Nakamura, Koki; and Kojima, Tetsuro, 5,151,357, Cl. 430-610.000.

Komatsu, Kouichiro: *See—*
Magome, Nobutaka; Ota, Kazuya; Mizutani, Hideo; and Komatsu, Kouichiro, 5,151,750, Cl. 356-401.000.

Komatu, Yuuki: *See—*
Sasho, Manabu; Yamauchi, Hiroshi; Yamanaka, Motosuke; Nakamura, Takaharu; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; and Negi, Shigeto, 5,151,417, Cl. 514-202.000.

Komitsch, Gregory A.: *See—*
Weissenborn, Richard K.; and Komitsch, Gregory A., 5,150,887, Cl. 269-71.000.

Komori, Masaaki: *See—*
Atsumi, Kiminori; Saito, Tomoki; and Komori, Masaaki, 5,151,122, Cl. 106-35.000.

Kompan A/S: *See—*
Wils, Tom L., 5,150,509, Cl. 29-525.100.

Komurasaki, Satoshi, to Mitsubishi Denki K.K. Acceleration detector. 5,150,606, Cl. 73-35.000.

Komuro, Kyozi; Hayakawa, Atsuya; and Shimizu, Hideaki, to Brother Kogyo Kabushiki Kaisha. Embroidery pattern data processor having a sewing order designation mechanism. 5,151,863, Cl. 364-470.000.

Komuro, Masakatsu: *See—*
Irikura, Tsutomu; Uchida, Hirohsi; Imai, Jun; and Komuro, Masakatsu, 5,151,434, Cl. 514-300.000.

Komuro, Toshio, to NEC Corporation. CMOS high voltage switch. 5,151,616, Cl. 307-451.000.

Konami Co., Ltd.: *See—*
Kitaue, Kazumi, 5,150,899, Cl. 273-85.00G.

Kondo, Haruhiko, to Mitsubishi Denki K.K. Synchronized slave station connection apparatus for a data communication network. 5,151,898, Cl. 370-85.150.

Kondo, Katsuhiko, to Mitsubishi Denki K.K. Electronic control apparatus for an internal combustion engine. 5,150,695, Cl. 123-571.000.

Kondo, Mitsuhiro: *See—*
Hiroi, Atsushi; Kondo, Mitsuhiro; and Ohshima, Kinya, 5,151,771, Cl. 357-70.000.

Kondo, Munenari; Imai, Masahito; Narita, Ryoichi; and Maeda, Takushi, to Nippondenso Co., Ltd. Semiconductor strain sensor and manufacturing method thereof. 5,150,616, Cl. 73-517.00R.

Konica Corporation: *See—*
Kawahara, Setsuko; Nakano, Yasushi; and Koyama, Noboru, 5,151,323, Cl. 428-323.000.
Kumamoto, Kenji; and Sasaki, Kunitsuna, 5,151,330, Cl. 428-425.900.
Nagatsuka, Sumiya; Takeuchi, Hiroshi; and Karasawa, Haruo, 5,151,947, Cl. 382-6.000.

Konig, Klaus: *See—*
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000.

Konishi, Kunihiko: *See—*
Kato, Yasuyoshi; Konishi, Kunihiko; Teshima, Nobue; Matsuda, Toshiaki; and Akama, Hiroshi, 5,151,256, Cl. 423-210.000.

Konishi, Sakuichi: *See—*
Kuwajima, Teruaki; Umeda, Shinichiro; Watanabe, Masakazu; and Konishi, Sakuichi, 5,151,125, Cl. 106-503.000.

Konishi, Yasuhiro: *See—*
Yamazaki, Akira; Kumanoya, Masaki; Konishi, Yasuhiro; and Dosaka, Katsumi, 5,151,614, Cl. 307-272.300.

Konstantinidou, Smaragda: *See—*
Snyder, Lawrence; and Konstantinidou, Smaragda, 5,151,900, Cl. 370-94.300.

Koontz, Stephen W.: *See—*
Merkel, Edwin W.; and Koontz, Stephen W., 5,150,861, Cl. 244-91.000.

Kopera, John J. C.: *See—*
Depa, Henry F.; and Kopera, John J. C., 5,150,683, Cl. 123-417.000.

Korpusik, John: *See—*
Marzucco, Teresa; Korpusik, John; and Martin, Patricia A., 5,151,999, Cl. 395-800.000.

Korsatko-Wabnegg, Brigitta; Korsatko, Werner; and Wegleitner, Karlheinz, to Lenzing Aktiengesellschaft. Delayed-release pharmaceutical preparation. 5,151,273, Cl. 424-465.000.

Korsatko, Werner: *See—*
Korsatko-Wabnegg, Brigitta; Korsatko, Werner; and Wegleitner, Karlheinz, 5,151,273, Cl. 424-465.000.

Korsunky, Iosif; and Grabbe, Dimitry G., to AMP Incorporated. Electrical terminal which has overstress protection. 5,151,046, Cl. 439-326.000.

Korte, Siegfried: *See—*
Heinz, Hans-Detlef; Pielartzik, Harald; Reinking, Klaus; Meyer, Rolf-Volker; and Korte, Siegfried, 5,151,458, Cl. 524-190.000.

Koskol, Joseph E.: *See—*
Blackwell, Daniel C.; and Koskol, Joseph E., 5,150,739, Cl. 139-452.000.

Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Method of assembling exterior parts of a motorcar onto a motorcar body. 5,150,506, Cl. 29-407.000.

Kotani, Reiichi: *See—*
Goto, Jugo; Kubota, Tsutomu; Kotani, Reiichi; and Miyaji, Masuo, 5,151,454, Cl. 522-93.000.

Kotwal, Girish J.; and Moss, Bernard, to United States of America, America. Gene encoding serine protease inhibitor. 5,151,509, Cl. 536-27.000.

Koupal, Lawrence: *See—*
Dombrowski, Anne W.; and Koupal, Lawrence, 5,151,365, Cl. 435-254.000.

Kowalczyk, Michael S.: *See—*
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Koyama, Noboru: *See—*
Kawahara, Setsuko; Nakano, Yasushi; and Koyama, Noboru, 5,151,323, Cl. 428-323.000.

Koyama, Satoshi: *See—*
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 5,151,206, Cl. 252-62.510.

Koyama, Takeshi; and Abe, Takefumi, to Mitsubishi Gas Chemical Company, Inc. Naphthalene compounds. 5,151,549, Cl. 562-467.000.

Koyama, Yoshihisa: *See—*
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; and Uchiyama, Yuji, 5,151,781, Cl. 358-45.000.

Koyanagi, Osamu; Seki, Yasuharu; and Tsukushi, Masanori, to Hitachi, Ltd. Gas circuit breaker. 5,151,566, Cl. 200-110.00A.

Kozak, Michael: *See—*
Wentzek, Horst; and Kozak, Michael, 5,150,600, Cl. 72-426.000.

Kozak, Michael J.: *See—*
Hickey, Gregory M.; Green, Norbert J., Jr.; and Kozak, Michael J., 5,150,773, Cl. 188-79.550.

Kozole, Karl H.: *See—*
Carter, Stephen A.; Williamson, Bryan C.; and Kozole, Karl H., 5,150,690, Cl. 123-527.000.

Kramer, Carl, to WSP Ingenieurgesellschaft fur Warmetechnik, Stromungstechnik und Prozesstechnik mit beschrankter Haftung. Apparatus for the bilateral blowing onto a web-like or sheet-like material. 5,150,534, Cl. 34-155.000.

Kratt, Alfred: *See—*
Kohler, Rolf; Kratt, Alfred; and Franzke, Klaus, 5,150,698, Cl. 123-690.000.

Krawczyk, Joanne M.: *See—*
Hendry, Donald H.; Johnson, Bruce K.; Krawczyk, Joanne M.; and Vierstra, Bruce C., 5,151,728, Cl. 354-83.000.

Kreibich, Ursula: *See—*
Strasilla, Dieter; Stossel, Richard; Mulhaupt, Rolf; and Kreibich, Ursula, 5,151,318, Cl. 428-246.000.

Kreinberg, Earl R.; and Adcock, Marty E., to AMP Incorporated. Grounding connector. 5,151,560, Cl. 174-94.00R.

Krichever, Mark; and Metlitsky, Boris, to Symbol Technologies, Inc. Point-of-sale system including detachable infinitely adjustable optical scanner with selecuon of scan pattern. 5,151,581, Cl. 235-467.000.

Krol, Denise M.; and Simpson, Jay R., to AT&T Bell Laboratories. Optical frequency second harmonic generator. 5,151,817, Cl. 359-328.000.

Krones AG Hermann Kronseder Maschinenfabrik: *See—*
Richter, Stefan, 5,150,782, Cl. 198-394.000.

Kruger, Leon J.; and Oatley, John A., to McNeil-PPC, Inc. Method and apparatus for applying a substance to an article. 5,151,301, Cl. 427-294.000.

Krupnick, Steven B.: *See—*
Hall, Bradford D.; and Krupnick, Steven B., 5,150,710, Cl. 128-653.500.

Krzywicki, Stanley J.; Gibson, Timothy S.; and Orndorff, Joseph D., to Systems Control, Inc. Tachometer system for measuring the RPM of an internal combustion engine with no physical or visual connection. 5,151,654, Cl. 324-160.000.

Kubicek, Donald H.: *See—*
Schubert, Paul F.; Kubicek, Donald H.; and Kidd, Dennis R., 5,151,401, Cl. 502-329.000.

Kubis, Heribert: *See—*
Wittmann, Dieter; and Kubis, Heribert, 5,150,678, Cl. 123-321.000.

Kubo, Yoichiro: *See—*
Kitahara, Shizuo; Nakamura, Eitaro; and Kubo, Yoichiro, 5,151,333, Cl. 428-694.000.

Kubota, Akinori: *See—*
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.

Kubota, Tsutomu: *See—*
Goto, Jugo; Kubota, Tsutomu; Kotani, Reiichi; and Miyaji, Masuo, 5,151,454, Cl. 5ₓ2-93.000.

Kubota, Yoshiya: *See—*
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.

Kuczynski, Charles P., to Ty-Breakers Corp. Fabric material and clothing apparel and apparel accessories made therefrom. 5,150,660, Cl. 112-402.000.

Kudo, Tomohiro: *See—*
Kawasaki, Keiichi; Ohkoda, Keiji; Kudo, Tomohiro; and Shimizu, Satoshi, 5,151,713, Cl. 346-108.000.

Kuenast, Christoph: *See—*
Mueller, Stefan; Theobald, Hans; Wolf, Bernd; Hofmeister, Peter; Kardorff, Uwe; and Kuenast, Christoph, 5,151,441, Cl. 514-378.000.

Kuijk, Karel E., to U.S. Philips Corporation. Active display device. 5,151,691, Cl. 340-784.000.

Kuizenga, Dirk J.: *See—*
Davenport, Scott A.; Ortiz, Mark V.; Chen, Linda; and Kuizenga, Dirk J., 5,151,909, Cl. 372-22.000.

Kukes, Simon G.; Clark, Frederick T.; Hopkins, P. Donald; and Green, Lisa M., to Amoco Corporation. Distillate hydrogenation. 5,151,172, Cl. 208-144.000.

Kulhanek, Antonin: *See—*
Muller, Klaus; and Kulhanek, Antonin, 5,151,162, Cl. 294-131.000.

Kull, Hermann; Berger, Joachim; Gerstung, Ulrich; and Bleuel, Klaus, to Robert Bosch GmbH. Supervisory system for a vehicle accelerator pedal travel transducer. 5,150,681, Cl. 123-399.000.

Kumagai, Ryohei, to Ezel Inc. Image processing method. 5,151,794, Cl. 358-447.000.

Kumaki, Tuneo; Nagase, Toshikatu; and Shichijo, Yasuhisa, to JPE Co., Ltd. Ink pot device for printing machine. 5,150,649, Cl. 101-365.000.

Kumamoto, Kenji; and Sasaki, Kunitsuna, to Konica Corporation. Magnetic recording medium comprising magnetic particles and a polyurethane resin binder having a polycaprolactone structural unit. 5,151,330, Cl. 428-425.900.

Kumanoya, Masaki: *See—*
Yamazaki, Akira; Kumanoya, Masaki; Konishi, Yasuhiro; and Dosaka, Katsumi, 5,151,614, Cl. 307-272.300.

Kummer, Rudolf: *See*—
Joerg, Klaus; Kummer, Rudolf; and Mueller, Franz-Josef, 5,151,541, Cl. 558-277.000.
Kumpfbeck, Richard J.; and Hannan, Peter W., to Hazeltine Corporation. Linear array antenna with e-plane backlobe suppressor. 5,151,707, Cl. 343-705.000.
Kumura, Tatsuo: *See*—
Sakata, Matsumi; Kumura, Tatsuo; Suzuki, Atsushi; Ikeda, Yoshito; Aoki, Kaoru; Kojima, Naoto; and Mishima, Akio, 5,150,511, Cl. 29-603.000.
Kundu, Snehamay: *See*—
Hooper, Donald F.; Finnerty, James L.; Fite, David B.; and Kundu, Snehamay, 5,151,867, Cl. 364-489.000.
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Miyahara, Shyoichiro; Suzuki, Maki; Shindo, Atsunori; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, 5,151,359, Cl. 435-226.000.
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Kyogoku, Hiroshi: *See*—
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Nakano, Hirofumi; Kawada, Shozo; Uosaki, Yoichi; Saito, Yutaka; Gomi, Katsushige; and Iwazaki, Toshiaki, 5,151,352, Cl. 435-123.000.
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Lai, Mei-Huei T.: *See*—
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Chiang, Long Y.; and Lai, Wen-Yih F., 5,151,478, Cl. 526-258.000.
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Landeta, David S., to Harris Corporation. Single chip 2-D convolver. 5,151,953, Cl. 382-41.000.
Lang, Gerard: *See*—
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Lappe, Peter; and Springer, Helmut, to Hoechst Aktiengesellschaft. Process for the recovery of rhodium from the residues of distillation processes. 5,151,537, Cl. 556-136.000.
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Larsson, Kare: *See*—
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Lau, Hon-Peng P.; and Miller, Warren K., to Du Pont de Nemours, E. I., and Company. Enzyme-linked immunoassay for measurement of cyclosporin a levels in whole blood samples. 5,151,348, Cl. 435-7.920.
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Lawson, Kenneth T.: *See*—
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Lear Seating Corporation: *See*—
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Lee, Cheng S.: *See*—
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Lee, George C.; and Sun, Xianyi, to Research Foundation of State Univ. of N.Y., The. Determination of ambient light level changes in visual images. 5,151,945, Cl. 382-1.000.
Lee, Kang-Wook, to International Business Machines Corporation. Structure and method for enhancing adhesion to a polyimide surface. 5,151,304, Cl. 427-250.000.
Leeb, Richard: *See*—
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Lees, David W., Sr.: *See*—
Beebe, James C.; Cargould, Barry D.; and Lees, David W., Sr., 5,151,870, Cl. 364-556.000.
le Gauyer, Philippe, to Valeo. Heat exchanger apparatus for a motor vehicle, having a main heat exchanger comprising a water box containing a secondary heat exchanger. 5,151,157, Cl. 165-140.000.
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Leigh, William E. Adjustable subdividable multi-compartment refuse container. 5,150,809, Cl. 220-404.000.

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Le-Khac, Bi, to Arco Chemical Technology, L.P. Polymer compositions and absorbent fibers produced therefrom. 5,151,465, Cl. 524-549.000.

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Leone, Nicola. Picket fence assembly. 5,150,885, Cl. 256-22.000.

Lepagnol, Jean: *See—*
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Leroy, Frederic: *See—*
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Leslie, Samuel A.; and Gordon, Robert T., to Orion Industries, Inc. System and method for extending cell site coverage. 5,152,002, Cl. 455-11.100.

Lessels, Alison B.: *See—*
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Lessi, Jacques; and Wittrisch, Christian, to Institut Francais du Petrole. Device for activating and measuring nonflowing producing wells. 5,150,750, Cl. 166-66.400.

Leung, Charles S.: *See—*
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Levanon, Avigdor; Oppenheim, Amos B.; and Locker-Giladi, Hilla, to Bio-Technology General Corp. Expression vectors containing lambdapl promoter, T_1T_2 RRNA termination sequence, and origin of replication derived from a constitutive high copy number plasmid, and hosts containing the plasmids. 5,151,364, Cl. 435-252.330.

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Huijben, Gregorius J.; van Kralingen, Cornelis G.; Liem, Seeng D; and Paoli, Michele E., 5,151,208, Cl. 252-174.140.

Levy, Guy, to Endo Technic Corporation. Removing physiologic tissue from a tooth canal. 5,151,029, Cl. 433-29.000.

Levy, Guy, to Endo Technic Corporation. Filling or coating mineralized physiologic tissue. 5,151,031, Cl. 433-226.000.

Lew, Hyok S. Dual revolving vane pump-motor-meter. 5,150,612, Cl. 73-253.000.

Lewis, Lynette A.; and Yip, M. Teresa, to Miles Inc. Lithium salts as red blood cell lysing and hemoglobin denaturing reagents. 5,151,369, Cl. 436-67.000.

Lewis, Thomas E.: *See—*
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Liljegren, Gordon E.; and Inglish, David S., to Walt Disney Company, The. Apparatus and method for editing film. 5,151,725, Cl. 352-129.000.

Lilly, Nathaniel W. Electrically heated color crayon pointer. 5,151,575, Cl. 219-385.000.

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de Seroux, Nicolas; and Limouzin, Dominique, 5,151,245, Cl. 376-271.000.

Lin, Jui C., to Taiwan Fu Hsing Industry Co., Ltd. Locking device for an auxiliary lock. 5,150,592, Cl. 70-190.000.

Lin, Ming-Zen, to Industrial Technology Research Institute. CMOS input buffer with low power consumption. 5,151,620, Cl. 307-475.000.

Lin, Yi-Teh. Method for folding pieces of paper into letters of the alphabet. 5,151,078, Cl. 493-405.000.

Lin, Yu. Handbrake operated control means for controlling vehicle accelerator pedal. 5,151,844, Cl. 361-179.000.

Lin, Yung-Hsiung. Fixture for a folding bed. 5,150,980, Cl. 403-24.000.

Linder, Charles: *See—*
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Lindsay, Richard A., to Vinten Group PLC. Control device for a tiltable mounting head. 5,150,627, Cl. 74-98.000.

Lindsay, Robert B.; and Parrish, Gary C., to Goodyear Tire & Rubber Company, The. System for retreading tires. 5,151,148, Cl. 156-351.000.

Lindsey, Mark J.: *See—*
Reiner, Thomas C.; Lindsey, Mark J.; and Kelkar, Krishnanand, 5,151,904, Cl. 371-43.000.

Ling, Chong-Kuan. Ejectively openable latch for luggage. 5,150,590, Cl. 70-69.000.

Ling, Hans G.: *See—*
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Lippai, Andre: *See—*
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Lisco, Inc.: *See—*
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Liu, Chien-Ching. Method of making non-nicotine cigarettes. 5,150,724, Cl. 131-359.000.

Liu, Matthew T., to Martin Marietta Corporation. High temperature ablative foam. 5,151,216, Cl. 252-307.000.

Liu, Yowjuang B.; Longcor, Steven W.; and Lein, Jih-Chang, to Advanced Micro Devices, Inc. Method for local oxidation of silicon employing two oxidation steps. 5,151,381, Cl. 437-69.000.

Livingston, Troy W., to Inn-Room Systems, Inc. Methods and apparatus for dispensing articles. 5,150,817, Cl. 221-81.000.

Livny, Izhak M.: *See—*
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Lo, William C.: *See—*
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Lobb, Ernest W.; Robbins, Bruce A.; and Depew, David L., to Svedala Industries, Inc. Railroad car positioning apparatus. 5,150,656, Cl. 104-162.000.

Lochkovic, Gregory A.: *See—*
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Lochrie, Harold J. M. Automatically lowering toilet seat. 5,150,483, Cl. 4-246.100.

Locker-Giladi, Hilla: *See—*
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Lockert, Timothy L. Materials stacking equipment. 5,151,009, Cl. 414-793.500.

Lodder, Bernhard; van Dijk, Berend J.; Paulen, Adriaan; and Oostenbrink, Albertus A., to Wavin B.V. Coupling sleeve for connection of a branch pipe to a main pipe. 5,150,928, Cl. 285-205.000.

Loebbert, Johannes. Waste disposal bag with a bag collar and lid. 5,150,810, Cl. 220-404.000.

Loeber, Frederick W.: *See—*
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Loertscher, Hanspeter. Apparatus for controlled tissue ablation. 5,151,098, Cl. 606-16.000.

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Logtens, Jozef P. M., to Xerox Corporation. Apparatus for forming and driving staples. 5,150,826, Cl. 227-88.000.

Lombardi, Steven A.; and Marasch, Richard D., to Allen-Bradley Company, Inc. Apparatus for controlling an electric motor. 5,151,642, Cl. 318-779.000.

Lonczak, John. Stacking and bundling form for newspapers to be recycled. 5,150,646, Cl. 106-34.000.

Long, Charles A., Jr.; and Goodwin, Todd W., to Long Technologies, Inc. Method and apparatus for locating a service pipe outlet transversely connected to a lined main pipe. 5,150,989, Cl. 405-303.000.

Long, David J.: *See—*
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Long, George L.: *See—*
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Long, Herbert D., Jr., to Harnischfeger Corporation. Anti-sway reeving system. 5,150,799, Cl. 212-147.000.

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Longacre & White: *See—*
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Longcor, Steven W.: *See—*
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Lorenz, Alan S.; and Sutton, Christopher K., to Lynx Automation, Inc. Apparatus for automatically connecting terminal device to telephone lines. 5,151,972, Cl. 379-93.000.
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Lownds, Charles M., to Mining Services International Corp. Blasting composition and method. 5,151,138, Cl. 149-21.000.
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Lubowitz, Hyman R.; and Sheppard, Clyde H., to Boeing Company, The. Method of preparing a crosslinking oligomer. 5,151,487, Cl. 528-170.000.
Lucas, Christian; and Bardin, Roland, to Look S.A. Ski brake. 5,150,912, Cl. 280-605.000.
Luk Lamellen und Kupplungsbau GmbH: *See—*
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Maucher, Paul; and Friedmann, Oswald, 5,151,065, Cl. 464-68.000.
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Lyke, David G.; and Ominsky, Mark, to International Business Machines Corporation. System and method for processing documents having amounts recorded thereon. 5,151,948, Cl. 382-7.000.
Lynam, Niall R.: *See—*
Varaprasad, Desaraju V.; Habibi, Hamid R.; Lynam, Niall R.; and Desaraju, Padma, 5,151,816, Cl. 359-275.000.
Lynch, Kenneth R.: *See—*
Fredericks, Kenneth J.; and Lynch, Kenneth R., 5,151,977, Cl. 395-200.000.
Lynde, Gerald D.: *See—*
Cassel, Terry E.; Payne, Harold E.; and Lynde, Gerald D., 5,150,755, Cl. 166-297.000.
Lynx Automation, Inc.: *See—*
Lorenz, Alan S.; and Sutton, Christopher K., 5,151,972, Cl. 379-93.000.
Lysenko, Zenon: *See—*
Harris, William J.; and Lysenko, Zenon, 5,151,490, Cl. 528-183.000.
MA MA-Macaroni Co., Ltd.: *See—*
Ozawa, Ryutaro; Hayakawa, Tomoya; Kato, Noriko; Kobayashi, Soichi; and Fuse, Seisaku, 5,151,289, Cl. 426-557.000.
Maaser, Heidrun E., to Colgate-Palmolive Company. Liquid softergent formulations having improved stability and softening properties. 5,151,223, Cl. 252-547.000.
Mabuchi, Yoshinobu: *See—*
Arizumi, Masato; Ozawa, Norio; Haruta, Yasuo; and Mabuchi, Yoshinobu, 5,151,932, Cl. 379-106.000.
MAC Tools, Inc.: *See—*
Myers, Dean E., 5,150,610, Cl. 73-118.100.
MacDonald, Daniel W.: *See—*
Lundy, Douglas A.; Jugle, Kip L.; MacDonald, Daniel W.; Berman, Robin E.; and Hurwitch, Carl B., 5,151,744, Cl. 355-296.000.
Machida, Satoshi; Kawahara, Yukito; and Mukainakano, Hiroshi, to Seiko Instruments Inc. Image sensor having an array of operative and dummy bipolar transistors and pairs of pixel selecting switches connected thereto. 5,151,587, Cl. 250-208.100.
Macromedia, Inc.: *See—*
Capps, Stephen P., 5,151,998, Cl. 395-800.000.
Madou, Marc J.; Narang, Subhash C.; Otagawa, Takaaki; and Wing, Sharon, to Osaka Gas Company, Ltd. Tetrasulfonated metal phthalocyanine doped electrically conducting electrochromic poly(dithiophene) polymers. 5,151,224, Cl. 252-586.000.
Maeda, Takushi: *See—*
Kondo, Munenari; Imai, Masahito; Narita, Ryoichi; and Maeda, Takushi, 5,150,616, Cl. 73-517.00R.
Mafoti, Robson: *See—*
Sanders, Joseph; Mafoti, Robson; and Markusch, Peter H., 5,151,470, Cl. 525-407.000.
Magauran, Edward D.: *See—*
Cody, Charles A.; and Magauran, Edward D., 5,151,155, Cl. 162-5.000.
Magee, Thomas J.; Leung, Charles S.; and Press, Richard L., to Amoco Corporation. Method for cleaning surfaces using UV lasers. 5,151,135, Cl. 134-1.000.
Maginness, Maxwell G., to Gregtag Systems, Inc. Method of checking correlation between parts of a photofinishing order through the use of error weights. 5,151,579, Cl. 235-375.000.
Magnet, Jean-Louis, to S.E.M.T. Pielstick. Method of monitoring emission of nitrogen oxides by an internal combustion engine. 5,150,682, Cl. 123-417.000.
Magome, Nobutaka; Ota, Kazuya; Mizutani, Hideo; and Komatsu, Kouichiro, to Nikon Corporation. Alignment apparatus. 5,151,750, Cl. 356-401.000.
Maguire, Sean P. Beach blanket anchor apparatus. 5,150,485, Cl. 5-417.000.
Maher, David L.; Rodriquez, Callista M.; and Trahan, Paul A., to General Electric Company. Propellant magazine for field artillery piece. 5,151,556, Cl. 89-35.010.
Maher, James F.: *See—*
Hwang-Felgner, Jiin-Yu; Jones, Richard E.; and Maher, James F., 5,151,265, Cl. 424-85.500.
Mahlum, James A.: *See—*
Beaulieu, Norman R.; Clark, David E.; Clingman, Arthur B., III; Jeffrey, Richard F.; Mahlum, James A.; and Reeves, Larry E., 5,151,075, Cl. 493-179.000.
Maholland, Michael K.: *See—*
Fu, Chia-Min; Maholland, Michael K.; and Lowery, Richard E., 5,151,391, Cl. 502-27.000.
Mahuzier, Georges: *See—*
Reveilleau, Pierre; Mahuzier, Georges; Chalom, Joseph; Farinotti, Robert; Tod, Michel; and Barre, Edith, 5,151,517, Cl. 546-66.000.
Maier, Dieter; Egner, Harald; Frohlich, Stefan; and Hoffmann, Jurgen, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Method for shaping workpieces from thermoplastics. 5,151,241, Cl. 264-314.000.
Maier, Joseph K.; Vavrek, Robert M.; and Glover, Gary H., to General Electric Company. Correction of NMR data acquired by an echo-planar technique. 5,151,656, Cl. 324-309.000.
Maignan, Jean: *See—*
Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; and Colin, Michel, 5,151,534, Cl. 554-88.000.
Majestic, Veronica K.; and Strong, Russell C., to Nalco Chemical Company. Chemical abatement of carbonate cracking. 5,151,220, Cl. 252-392.000.
Major, Kenneth E.; Baker, John L.; and Braunagel, David K., to Hy-Tech Hydraulics, Inc.; and Breston, Michael P. Controlled-flow lubricating system. 5,150,769, Cl. 184-31.000.
Major, Kenneth E.; Baker, John L.; and Braunagel, David K., to Hy-Tech Hydraulics, Inc.; and Breston, Michael P. Compact self-lubricating bearing system. 5,150,975, Cl. 384-465.000.
Maki, William M.: *See—*
Akin, Timur; Myers, Bruce A.; Maki, William M.; and Palanisamy, Ponnusamy, 5,151,777, Cl. 357-81.000.
Makiguchi, Nobuyoshi: *See—*
Miyahara, Shyoichiro; Suzuki, Maki; Shindo, Atsunori; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, 5,151,359, Cl. 435-226.000.
Makihara, Nobuo: *See—*
Tahara, Hideo; and Makihara, Nobuo, 5,151,058, Cl. 440-61.000.
Makino, Jun, to Canon Kabushiki Kaisha. Light deflecting apparatus. 5,151,811, Cl. 359-198.000.
Makino, Takayuki: *See—*
Mukai, Nobuhiro; Ige, Hitoshi; Makino, Takayuki; and Atarashi, Junko, 5,151,479, Cl. 526-277.000.
Malinge, Jean: *See—*
Spitz, Roger; Malinge, Jean; and Joly, Jean-Francois, 5,151,396, Cl. 502-104.000.
MAN Nutzfahrzeuge Aktiengesellschaft: *See—*
Wittmann, Dieter; and Kubis, Heribert, 5,150,678, Cl. 123-321.000.

Manabe, Toshiyuki: *See*—
Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiro; Hirashima, Isao; and Ushijima, Kazuhiro, 5,150,919, Cl. 280-732.000.
Manlove, Gregory J.: *See*—
Marrah, Jeffrey J.; Manlove, Gregory J.; Kennedy, Richard A.; and Kady, Mark A., 5,151,939, Cl. 381-15.000.
Mann, Egon; Eymuller, Helmut; and Stutzle, Siegfried, to Zahnradfabrik Friedrichshafen AG. Driving mechanism with two speed clutch. 5,151,068, Cl. 475-322.000.
Mann, Lloyd J. Orthodontic device for small animals. 5,151,027, Cl. 433-1.000.
Mannesmann Aktiengesellschaft: *See*—
Unewisse, Heinz, 5,150,519, Cl. 29-890.140.
Manusch, Cristoph; and Harp, Hans-Jurgen, to Pelikan Aktiengesellschaft. Clutch for tape dispenser. 5,150,851, Cl. 242-68.100.
Marasch, Richard D.: *See*—
Lombardi, Steven A.; and Marasch, Richard D., 5,151,642, Cl. 318-779.000.
Marek, Jiri; Bantien, Frank; Haack, Dietmar; and Warth, Martin, to Robert Bosch GmbH. Acceleration and vibration sensor and method of making the same. 5,151,763, Cl. 357-26.000.
Marelli Autronica SpA: *See*—
Nepote, Andrea; and Boella, Marcello, 5,151,634, Cl. 315-307.000.
Vercesi, Roberto; and Bettini, Roberto, 5,151,646, Cl. 322-28.000.
Mares, Frank: *See*—
Oxenrider, Bryce C.; Long, David J.; and Mares, Frank, 5,151,477, Cl. 526-216.000.
Marfilius, Donald F.; and Schulte, Steven A., to Lear Seating Corporation. Automotive armrest with cupholder. 5,150,946, Cl. 297-194.000.
Margot, Paul-Andre: *See*—
Gernet, Pierre; Steinemann, Werner; and Margot, Paul-Andre, 5,151,677, Cl. 338-99.000.
Marinitsch, Waldemar. Fail-safe testing of an infrared sensor arrangement. 5,151,682, Cl. 340-514.000.
Markiewicz, Stanley. Energy recovery system for cold storage warehouse. 5,150,585, Cl. 62-467.000.
Marks, Mortimer. System and devices for time delay 3D. 5,151,821, Cl. 359-462.000.
Markusch, Peter H.: *See*—
Sanders, Joseph; Mafoti, Robson; and Markusch, Peter H., 5,151,470, Cl. 525-407.000.
Marquardt, Kurt: *See*—
Arndt, Ulrich; Luneburg, Peter; Marquardt, Kurt; Pierags, Hans-Joachim; and Zeuschner, Ulrich, 5,151,280, Cl. 425-186.000.
Marquis, Edward T.; Sanderson, John R.; and Meyer, Robert A., to Texaco Chemical Company. Treatment of tertiary butyl hydroperoxide distillation fraction to remove acidic contaminants. 5,151,530, Cl. 549-529.000.
Marrah, Jeffrey J.; Manlove, Gregory J.; Kennedy, Richard A.; and Kady, Mark A., to Delco Electronics Corporation. Adaptive audio processor for AM stereo signals. 5,151,939, Cl. 381-15.000.
Marshall, Richard A.; Hershberger, James W.; and Hershberger, Susan A., to Goodyear Tire & Rubber Company, The. Micro-suspension polymerization of vinyl chloride with ascorbic acid and water-soluble metal salts. 5,151,476, Cl. 526-93.000.
Martek Corporation: *See*—
Delente, Jacques J.; Behrens, Paul W.; and Hoeksema, Scot D., 5,151,347, Cl. 435-3.000.
Marteney, Pierre J.: *See*—
Spadaccini, Louis J.; Marteney, Pierre J.; and Colket, Meredith B., III, 5,151,171, Cl. 208-48.00Q.
Martens, Feodor B.: *See*—
Strasser, Alexander; Martens, Feodor B.; Dohmen, Jurgen; and Hollenberg, Cornelius P., 5,151,354, Cl. 435-161.000.
Martensson, Nils E., to Technophone Limited. Variable configuration portable telephone. 5,151,946, Cl. 379-38.000.
Martin Marietta Corporation: *See*—
Liu, Matthew T., 5,151,216, Cl. 252-307.000.
Martin, Patricia A.: *See*—
Marzucco, Teresa; Korpusik, John; and Martin, Patricia A., 5,151,999, Cl. 395-800.000.
Martins Leites, Jose M.; Cardosomendes, Jose A.; Lippai, Andre; and Dellanoce, Paulo T., to Metal Leve S/A Industria E Comercio. Method of manufacturing a piston. 5,150,517, Cl. 29-888.040.
Marttila, Tom E.; Kivisto, Tuomo V. J.; and Ahola, Pentti V., to Outokumpu Oy. Automatic charging member. 5,151,006, Cl. 414-626.000.
Maruo, Tomohiro, to Matsushita Electric Industrial Co., Ltd. Industrial use robot with horizontal multiple articulated arms with means to minimize or eliminate interference among driving portions. 5,151,007, Cl. 414-744.200.
Marzucco, Teresa; Korpusik, John; and Martin, Patricia A., to Wang Laboratories, Inc. Serial communications controller for transfer of successive data frames with storage of supplemental data and word counts. 5,151,999, Cl. 395-800.000.
Mass, Barton, to Purus, Inc. Chamber design and lamp configuration for an ultraviolet photochemical reactor. 5,151,252, Cl. 422-186.300.
Massof, Robert W.; O'Shea, Donald C.; and Raasch, Thomas W., to Johns Hopkins University, The. Video display on spectacle-like frame. 5,151,722, Cl. 351-158.000.
Massucco, Arthur A.: *See*—
Silvenis, Scott A.; Monaghan, Paul B.; Massucco, Arthur A.; Spencer, Richard H.; and Gagne, William R., 5,150,841, Cl. 239-332.000.
Masters, Colin L.: *See*—
Salbaum, Johannes M. H.; Masters, Colin L.; and Beyreuter, Konrad T., 5,151,508, Cl. 536-27.000.
Masubuchi, Takamichi: *See*—
Suzuki, Hideo; Matsushima, Shunichi; Masubuchi, Takamichi; Obata, Masahiko; and Sakama, Masao, 5,151,553, Cl. 84-600.000.
Masuda, Isao: *See*—
Yoshikawa, Takao; and Masuda, Isao, 5,151,792, Cl. 358-327.000.
Masuda, Shunichi, to Canon Kabushiki Kaisha. Image forming apparatus. 5,151,573, Cl. 219-216.000.
Masuda, Yoshitaka, to Canon Kabushiki Kaisha. Image reading apparatus with corrected optical length. 5,151,593, Cl. 250-234.000.
Masur, Ernst; Ruoff, Gottfried; and Planek, Werner, to FAG Kugelfischer Georg Schafer KgaA. Mounting sleeve for anti-friction bearing. 5,150,973, Cl. 384-448.000.
Mathis, Michael P.: *See*—
Reeves, William G.; Powers, Michael D.; Mathis, Michael P.; and Duello, Leonard E., 5,151,321, Cl. 428-286.000.
Matkovich, Vlado I.; Degen, Peter J.; Gsell, Thomas C.; Bormann, Thomas; and Rothman, Isaac, to Pall Corporation. Method for removing heparin from blood or plasma. 5,151,192, Cl. 210-646.000.
Matsuda, Genichi; and Sugii, Takesi, to Fujitsu Limited. Reusable ink sheet for use in heat transfer recording. 5,151,326, Cl. 128-336.000.
Matsuda, Naoto: *See*—
Koide, Tomoyuki; Matsuda, Naoto; Nakamura, Koki; and Kojima, Tetsuro, 5,151,357, Cl. 430-610.000.
Matsuda, Takashi, to Casio Computer Co., Ltd. High speed switch scanning apparatus. 5,151,554, Cl. 84-655.000.
Matsuda, Terumi: *See*—
Kohda, Katsuhiro; and Matsuda, Terumi, 5,151,604, Cl. 250-484.100.
Matsuda, Toshiaki: *See*—
Kato, Yasuyoshi; Konishi, Kunihiko; Teshima, Nobue; Matsuda, Toshiaki; and Akama, Hiroshi, 5,151,256, Cl. 423-210.000.
Matsui, Fumio: *See*—
Yanagisawa, Shuichi; Sakai, Tatsuro; Murata, Yasushi; Matsui, Fumio; and Mitoh, Yasuo, 5,151,310, Cl. 428-64.000.
Matsui, Kiyoshi; Satoh, Ryohei; Netsu, Toshitada; Sasaki, Hideaki; Shirai, Mitugu; and Hamamura, Kenichi, to Hitachi, Ltd. Electronic circuit apparatus comprising a structure for sealing an electronic circuit. 5,151,773, Cl. 357-74.000.
Matsui, Kunio, to Fujitsu Limited. Dictionary linked text base apparatus. 5,151,857, Cl. 364-419.000.
Matsumoto, Kenichi: *See*—
Arahara, Kohzoh; Yuasa, Toshiya; Kai, Takashi; Tohyama, Noboru; Mouri, Akihiro; and Matsumoto, Kenichi, 5,151,712, Cl. 346-1.100.
Matsumoto, Kenji: *See*—
Nishiyama, Yoshinori; Yanagita, Tomoatsu; Nagai, Masahiko; Morikuni, Mitsuru; and Matsumoto, Kenji, 5,151,868, Cl. 364-490.000.
Matsumoto, Shigeyuki; and Ikeda, Osamu, to Canon Kabushiki Kaisha. Process for forming metal deposited film containing aluminum as main component by use of alkyl aluminum hydride. 5,151,305, Cl. 427-252.000.
Matsumoto, Takeshi: *See*—
Idaka, Yukio; Yamaguchi, Shuichiroh; Miyajima, Hisakazu; Matsumoto, Takeshi; and Miyamoto, Yasunori, 5,151,602, Cl. 250-551.000.
Matsumura, Kimiharu; Sakai, Hiroyuki; Murakami, Masaaki; Oda, Tetsuya; and Yamaguchi, Chizo, to Tokyo Electron Limited; and Tokyo Electron Kyushu Limited. Method for heat-processing semiconductor device and apparatus for the same. 5,151,871, Cl. 364-557.000.
Matsuno, Yoshio; Choji, Shinichiro; Ito, Kazuhiko; and Shigeta, Teruaki, to Nissan Motor Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Vehicle room floor illuminating apparatus. 5,151,850, Cl. 362-75.000.
Matsuo, Kazuhiro: *See*—
Murakami, Koichi; Matsuo, Kazuhiro; Iizumi, Kenichi; and Tagawa, Yoichi, 5,150,998, Cl. 412-14.000.
Matsuo, Noritada: *See*—
Sakamoto, Noriyasu; Kisida, Hirosi; Fujimoto, Hiroaki; Umeda, Kimitoshi; and Matsuo, Noritada, 5,151,428, Cl. 514-277.000.
Matsuo, Tamotsu: *See*—
Yamasaki, Yukihiro; Suetsugu, Toshio; Matsuo, Tamotsu; and Okamura, Hideo, 5,151,893, Cl. 369-116.000.
Matsuo, Toshihisa: *See*—
Kunikawa, Norihide; Yamada, Yoshikado; Mori, Yoshiteru; and Matsuo, Toshihisa, 5,150,890, Cl. 271-9.000.
Matsuoka, Masahiro: *See*—
Takamoto, Ryuichi; Nanba, Ryujiro; Matsuoka, Masahiro; and Sawada, Tsuguo, 5,151,590, Cl. 250-215.000.
Matsuoka, Yukihiro: *See*—
Hirao, Akihiko; Sawada, Tomoyuki; Takayama, Shinji; Aoyama, Youichi; Matsuoka, Yukihiro; and Hiroshima, Tatsuo, 5,151,671, Cl. 335-172.000.
Matsushima, Shunichi: *See*—
Suzuki, Hideo; Matsushima, Shunichi; Masubuchi, Takamichi; Obata, Masahiko; and Sakama, Masao, 5,151,553, Cl. 84-600.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Hayashi, Takashi, 5,151,934, Cl. 379-159.000.
Ishida, Toshimichi; and Suzuki, Masaki, 5,151,008, Cl. 414-744.500.
Kawahara, Katsumi; Uchida, Masami; Yoshioka, Kazumi; Ohta, Takeo; and Horai, Keiichiro, 5,151,295, Cl. 427-12.000.
Kawamoto, Sigeharu, 5,151,786, Cl. 358-148.000.

Maruo, Tomohiro, 5,151,007, Cl. 414-744.200.
Matsuno, Yoshio; Choji, Shinichiro; Ito, Kazuhiko; and Shigeta, Teruaki, 5,151,850, Cl. 362-75.000.
Matsuzawa, Akira; Kanoh, Masaaki; and Tada, Shoichiro, 5,151,700, Cl. 341-156.000.
Saimi, Tetsuo; and Momoo, Kazuo, 5,151,889, Cl. 369-44.370.
Takeda, Etsuya; Nanno, Yutaka; and Nagata, Seiichi, 5,151,805, Cl. 359-57.000.
Wakita, Naohide; Iwai, Yoshio; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Johten, Kazuhiro; Kimura, Satoshi; and Fujiwara, Shozo, 5,151,803, Cl. 359-56.000.
Yamada, Toshio; and Inoue, Michihiro, 5,151,878, Cl. 365-189.010.
Yamamura, Souhei, 5,151,944, Cl. 381-151.000.
Yamasaki, Yukihiro; Suetsugu, Toshio; Matsuo, Tamotsu; and Okamura, Hideo, 5,151,893, Cl. 369-116.000.

Matsushita Electric Works, Ltd.: *See*—
Hirao, Akihiko; Sawada, Tomoyuki; Takayama, Shinji; Aoyama, Youichi; Matsuoka, Yukihiro; and Hiroshima, Tatsuo, 5,151,671, Cl. 335-172.000.
Idaka, Yukio; Yamaguchi, Shuichiroh; Miyajima, Hisakazu; Matsumoto, Takeshi; and Miyamoto, Yasunori, 5,151,602, Cl. 250-551.000.

Matsushita, Mutsuyoshi: *See*—
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000.

Matsuura, Hiromi: *See*—
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000.

Matsuura, Hiroshi, to Fujikiko Kabushiki Kaisha. Vehicle seat. 5,150,870, Cl. 248-421.000.

Matsuura, Hiroshi: *See*—
Negi, Yoshitaka; and Matsuura, Hiroshi, 5,150,871, Cl. 248-429.000.

Matsuzawa, Akira; Kanoh, Masaaki; and Tada, Shoichiro, to Matsushita Electric Industrial Co., Ltd. Serial-parallel type A/D converter. 5,151,700, Cl. 341-156.000.

Mattingly, Phillip G.: *See*—
Dombrowski, James E.; and Mattingly, Phillip G., 5,151,518, Cl. 546-107.000.

Mattingly, William B., III: *See*—
Glaug, Frank S.; and Mattingly, William B., III, 5,151,091, Cl. 604-385.100.

Matusewicz, Richard S.: *See*—
Strong, Kathleen M.; and Matusewicz, Richard S., 5,150,971, Cl. 383-84.000.

Maucher, Paul; and Friedmann, Oswald, to Luk Lamellen und Kupplungsbau GmbH. Torsion damping apparatus for use with friction clutches in the power trains of motor vehicles. 5,151,065, Cl. 464-68.000.

Maus, Wolfgang; and Swars, Helmut, to Emitec Gesellschaft fuer Emissionstechnologie MBH. Catalyst arrangement with flow guide body. 5,150,573, Cl. 60-299.000.

Maytag Corporation: *See*—
Griffith, Scott E.; Tuller, Barry E.; and Jackson, Charles L., 5,151,884, Cl. 368-10.000.

Mazda Motor Corporation: *See*—
Ninomiya, Hiroshi; and Fujikawa, Satoshi, 5,150,637, Cl. 74-335.000.
Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiro; Hirashima, Isao; and Ushijima, Kazuhiro, 5,150,919, Cl. 280-732.000.

Mazon, Yves: *See*—
Valmir, Francis; Mazon, Yves; and Schonenberger, Eric, 5,151,681, Cl. 340-454.000.

Mazzoleni, Giancarlo; and Baker, Gordon M. Centering device for use with Brinell hardness-measuring probe. 5,150,608, Cl. 73-81.000.

McAllister, Michael J., to Advanced Dynamics Corporation. Thermoplastic tubular container for semiconductor devices with longitudinal opening means. 5,150,786, Cl. 206-328.000.

McCall, Patrick C.; and Cothran, Philip E., to Procter & Gamble Company, The. Shampoo compositions. 5,151,209, Cl. 252-174.150.

McCardell, Willard B., to Cardell Corporation. Micropin connector system. 5,151,052, Cl. 439-598.000.

McCarthy, Peter A.; and Walker, Frederick J., to Pfizer Inc. 3,5-dihydroxy-6,8-nonadienoic acids and derivatives as hypocholesterolemic agents. 5,151,545, Cl. 560-60.000.

McClelland, Gary M., to International Business Machines Corporation. Subpicosecond atomic and molecular motion detection and signal transmission by field emission. 5,151,594, Cl. 250-306.000.

McClune, Donald W., to Elco Corporation. Electrical contact system with cantilever mating beams. 5,151,056, Cl. 439-851.000.

McCormick, Christopher P.: *See*—
Kemp, David B.; McCormick, Christopher P.; and Fraser, Mark D., 5,151,730, Cl. 354-275.000.

McCoy, Kevin M., to American Cyanamid Company. Method for solubilization and naturation of somatotropins utilizing sulfolane. 5,151,501, Cl. 530-399.000.

McCrae, James M.: *See*—
Morrison, Donald J.; McGregor, David; and McCrae, James M., 5,151,129, Cl. 106-623.000.

McCrary, Avis L.: *See*—
Bertram, James L.; Walker, Louis L.; McCrary, Avis L.; and Cortez, Fermin M., 5,151,496, Cl. 528-500.000.

McCrimmon, Kevin D.: *See*—
Craw, Marjory T.; McCrimmon, Kevin D.; and Deschenes, Lyse L., 5,151,402, Cl. 502-401.000.

McCullough, Francis P., Jr.; and Stein, Stuart D., to Dow Chemical Company, The. Method and apparatus for separating fluids using a carbonaceous polymeric filter having a LOI greater than 40. 5,151,198, Cl. 210-767.000.

McCurry, Ronald C., to Ryobi Motor Products Corporation. Deadman switch arrangement for a hedge trimmer. 5,150,523, Cl. 30-228.000.

McDonnell Douglas Corporation: *See*—
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, 5,150,749, Cl. 165-41.000.
Ruffoni, John M., 5,151,222, Cl. 252-511.000.

McElroy, David J.: *See*—
Gill, Manzur; and McElroy, David J., 5,151,760, Cl. 357-23.500.

McGean-Rohco, Inc.: *See*—
Montgomery, Eda R.; and King, Randal D., 5,151,170, Cl. 205-298.000.

McGill, Shane R. Dispensing apparatus for frozen product. 5,150,820, Cl. 222-95.000.

McGregor, David: *See*—
Morrison, Donald J.; McGregor, David; and McCrae, James M., 5,151,129, Cl. 106-623.000.

McHale, Angelika H.: *See*—
Yates, John B., III; Pratt, Charles F.; and McHale, Angelika H., 5,151,460, Cl. 524-291.000.

McIntosh Laboratory, Inc.: *See*—
Van Gelder, Carl, 5,151,943, Cl. 381-189.000.

McKavanagh, Thomas P. Gate valve sleeve. 5,150,881, Cl. 251-174.000.

McKay, Michael L.; Thompson, Ian R.; and Sarich, Ralph T., to Orbital Engine Company Proprietary Limited. Method of fuel injection. 5,150,836, Cl. 239-5.000.

McKenzie, Robert W.: *See*—
Chandler, Kirk R.; and McKenzie, Robert W., 5,151,034, Cl. 439-79.000.

McKie, R. Thomas, to Shanley and Baker. Apparatus for size reduction of heavy solid waste materials. 5,150,844, Cl. 241-73.000.

Mc Lay, Iain M.: *See*—
Cook, David C.; Hart, Terance W.; Mc Lay, Iain M.; Palfreyman, Malcolm N.; Sharp, Brian W.; and Walsh, Roger J. A., 5,151,436, Cl. 514-314.000.

McNeil-PPC, Inc.: *See*—
Glaug, Frank S.; and Mattingly, William B., III, 5,151,091, Cl. 604-385.100.
Kruger, Leon J.; and Oatley, John A., 5,151,301, Cl. 427-294.000.

McNeil, Sandy: *See*—
Petty, John; and McNeil, Sandy, 5,150,930, Cl. 285-319.000.

McNeill, Ray O.: *See*—
Farrow, Robert I.; DeMint, Paul; Johnson, Drey; Gaude, Robert; and McNeill, Ray O., 5,150,849, Cl. 242-56.00R.

Mead Corporation, The: *See*—
Gottschalk, Peter; Neckers, Douglas C.; and Schuster, Gary B., 5,151,520, Cl. 548-110.000.
Hutchings, David A.; and Brandon, Richard L., 5,151,488, Cl. 528-179.000.

Meczkowski, Frank J.: *See*—
Adams, James; and Meczkowski, Frank J., 5,151,286, Cl. 426-324.000.

Medich, John R.: *See*—
Behling, James R.; Farid, Payman; Khanna, Ish; Medich, John R.; Prunier, Mike; Scaros, Mike G.; and Weier, Richard M., 5,151,519, Cl. 546-219.000.

Medico International, Inc.: *See*—
Anderson, Leslie B., 5,150,707, Cl. 128-402.000.

Medlicott, Mark, to Alcatel Business Systems. Dual-mode synchronization device, in particular for frame clock phase recovery in a half-duplex transmission system. 5,151,927, Cl. 375-119.000.

Meglio, William J., to Keystone Rustproofing, Inc. Sludge drying apparatus and method. 5,150,531, Cl. 34-11.000.

Meier, Hans-J., to Carl-Zeiss-Stiftung. Mirror support arrangement for a primary mirror of a telescope. 5,151,809, Cl. 359-846.000.

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Homonoff, Edward C.; Meierhoefer, Alan W.; and Flint, Lori B., 5,151,320, Cl. 428-284.000.

Meiss, Theodore D.: *See*—
Munday, Jerry T.; and Meiss, Theodore D., 5,151,494, Cl. 528-287.000.

Melanson, Dan: *See*—
Boyd, James A.; and Melanson, Dan, 5,150,662, Cl. 114-68.000.

Melvin, Terence: *See*—
Molitor, Robert P.; and Melvin, Terence, 5,150,906, Cl. 273-220.000.

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Perry, Mordechai; Yacubowicz, Henia; Linder, Charles; Nemas, Mara; and Katraro, Reuven, 5,151,182, Cl. 210-500.270.

Menelly, Richard A.: *See*—
Crane, Timothy T.; Menelly, Richard A.; and Danek, Robert J., 5,151,607, Cl. 250-556.000.
DeBiasi, Mark S.; and Menelly, Richard A., 5,151,842, Cl. 361-93.000.

Mercedes-Benz AG: *See*—
Leiber, Heinz; Steiner, Manfred; and Klinkner, Walter, 5,150,951, Cl. 303-100.000.

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Bagley, Scott; Greenlee, William J.; Dhanoa, Daljit S.; and Patchett, Arthur A., 5,151,435, Cl. 514-303.000.
DiNinno, Frank P.; Greenlee, Mark L.; and Salzmann, Thomas N., 5,151,512, Cl. 540-302.000.
Dombrowski, Anne W.; and Koupal, Lawrence, 5,151,365, Cl. 435-254.000.
Morita, Yoshiharu; Chaki, Haruyuki; Hoshide, Yasuo; and Takashima, Junko, 5,151,521, Cl. 548-112.000.
Rasmusson, Gary H.; and Reynolds, Glenn F., 5,151,429, Cl. 514-284.000.
Steinberg, Nathan G.; Rasmusson, Gary H.; and Salzmann, Thomas N., 5,151,430, Cl. 514-284.000.
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Finkelmann, Heino; and Messner, Bernfried, 5,151,481, Cl. 526-298.000.
Reiffenrath, Volker; and Finkenzeller, Ulrich, 5,151,213, Cl. 252-299.600.
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Hekker, Roeland M. T.; Livny, Izhak M.; and Mercurio, Gregory S., 5,151,822, Cl. 359-559.000.
Merilab, Inc.: *See*—
Merrill, M. Stanley; and Chapin, Thomas B., 5,150,515, Cl. 33-203.120.
Merkel, Edwin W.; and Koontz, Stephen W., to Boeing Company, The. Variable sweep side force generator and roll control device. 5,150,861, Cl. 244-91.000.
Merrell, Thomas D., Jr.: *See*—
Caldwell, Stephen P.; and Merrell, Thomas D., Jr., 5,151,661, Cl. 328-14.000.
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Cho, Hyun S.; Sung, Chien-Min; Merrill, Leo; and Chen, Sy-Hwa, 5,151,107, Cl. 51-295.000.
Merrill, M. Stanley; and Chapin, Thomas B., to Merilab, Inc. Kinetic wheel alignment system and method. 5,150,515, Cl. 33-203.120.
Merry, Richard P.; and Langer, Roger I., to Minnesota Mining and Manufacturing Company. Catalytic converter having a monolith mounting of which is comprised of partially dehydrated vermiculite flakes. 5,151,253, Cl. 422-179.000.
Meseltron S.A.: *See*—
Esteve, Xavier, 5,150,545, Cl. 51-165.740.
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Buhler, Wolfhardt; Poisel, Hans; and Trommer, Gert, 5,150,956, Cl. 356-350.000.
Messner, Bernfried: *See*—
Finkelmann, Heino; and Messner, Bernfried, 5,151,481, Cl. 526-298.000.
Metal Leve S/A Industria E Comercio: *See*—
Martins Leites, Jose M.; Cardosomendes, Jose A.; Lippai, Andre; and Dellanoce, Paulo T., 5,150,517, Cl. 29-888.040.
Metallgesellschaft AG: *See*—
Frank, Wolfgang; Loffler, Johannes; and Holle, Norbert, 5,150,729, Cl. 137-340.000.
Metlitsky, Boris; Swartz, Jerome; Barkan, Edward; Shepard, Howard; Goren, David; and Biuso, Tony, to Symbol Technologies, Inc. Light emitting diode scanner. 5,151,580, Cl. 235-462.000.
Metlitsky, Boris: *See*—
Krichever, Mark; and Metlitsky, Boris, 5,151,581, Cl. 235-467.000.
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Vacon, Gary; Visser, John A.; Engelse, Willem A. H.; and Metzger, Stephen D., 5,151,895, Cl. 370-85.100.
Mexmain, Jacques: *See*—
Guinet, Jannick; Hubert, Jean-Claude; Jarrige, Jean; Mexmain, Jacques; and Michelet, Jean-Pascal, 5,150,830, Cl. 228-124.000.
Meyer, John D.: *See*—
You, Young S.; and Meyer, John D., 5,151,120, Cl. 106-27.000.
Meyer, Robert A.: *See*—
Marquis, Edward T.; Sanderson, John R.; and Meyer, Robert A., 5,151,530, Cl. 549-529.000.
Meyer, Rolf-Volker: *See*—
Heinz, Hans-Detlef; Pielartzik, Harald; Reinking, Klaus; Meyer, Rolf-Volker; and Korte, Siegfried, 5,151,458, Cl. 524-190.000.
Meyerson, Bernard S.; Scott, Bruce A.; and Wolford, Donald J., Jr., to International Business Machines Corporation. Method for producing high energy electroluminescent devices. 5,151,383, Cl. 437;101-.
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Guinet, Jannick; Hubert, Jean-Claude; Jarrige, Jean; Mexmain, Jacques; and Michelet, Jean-Pascal, 5,150,830, Cl. 228-124.000.
Micron Technology, Inc.: *See*—
Gilton, Terry L.; Tuttle, Mark E.; and Cathey, David A, 5,151,168, Cl. 205-123.000.
Sandhu, Gurtej S., 5,151,061, Cl. 445-24.000.
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Abe, Akira; Mihayashi, Keiji; and Ichijima, Seiji, 5,151,344, Cl. 430-383.000.
Milan, Alain: *See*—
Szabo, Georges; Schasfoort, Egbertus F. P.; and Milan, Alain, 5,151,400, Cl. 502-203.000.
Miles Inc.: *See*—
Harasin, Stephen J.; Sounik, David F.; and Kelly, Timothy J., 5,151,483, Cl. 528-44.000.
Lewis, Lynette A.; and Yip, M. Teresa, 5,151,369, Cl. 436-67.000.
Sanders, Joseph; Mafoti, Robson; and Markusch, Peter H., 5,151,470, Cl. 525-407.000.
Milgram, Norton W., to Deprenyl Animal Health, Inc. Use of L-deprenyl for retention of specific physiological functions. 5,151,449, Cl. 514-654.000.
Miller, Bernard. Pivot assembly for tool guide. 5,150,993, Cl. 408-110.000.
Miller, Charles R.; Berry, Haskell B., Jr.; and Johnson, Tod S., to Premier Medical Technology, Inc. Apparatus and method for processing solid waste. 5,150,843, Cl. 241-27.000.
Miller, Gregory P., to Xerox Corporation. Universal fastener. 5,150,865, Cl. 248-71.000.
Miller, James B.: *See*—
Holloway, Sidney E., III; Crossley, Edward A., Jr.; Jones, Irby W.; Miller, James B.; Davis, C. Calvin; Behun, Vaughn D.; and Goodrich, Lewis R., Sr., 5,150,875, Cl. 248-550.000.
Miller, James E., to United States of America, Navy. Electrochemical noise measurement technique for the determination of aluminum alloy pit initiation rates. 5,151,163, Cl. 204-153.110.
Miller, Larry D.: *See*—
Charles, Harlan W.; and Miller, Larry D., 5,150,775, Cl. 188-299.000.
Miller, Ralph A., to Air Cruisers, Inc. Portable self-contained impact system. 5,150,767, Cl. 182-137.000.
Miller, Warren K.: *See*—
Lau, Hon-Peng P.; and Miller, Warren K., 5,151,348, Cl. 435-7.920.
Milliken Research Corporation: *See*—
Green, David E., 5,151,146, Cl. 156-177.000.
Mills, Donald: *See*—
Blanchet, Oscar; and Mills, Donald, 5,150,804, Cl. 220-212.000.
Mills, William C., Jr., to Recot, Inc. Crumb removal system. 5,150,798, Cl. 209-660.000.
Milunas, Rimas S.; and Nitz, Larry T., to Saturn Corporation. Multiple mode adaptive pressure control for an automatic transmission. 5,151,858, Cl. 364-424.100.
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Gray, Charles A.; Milunas, Rimas S.; and Nitz, Larry T., 5,151,855, Cl. 395-750.000.
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Kurimoto, Isao; and Minai, Masayoshi, 5,151,542, Cl. 558-277.000.
Mine, Kenji: *See*—
Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, 5,150,924, Cl. 285-101.000.
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Minezaki, Shigehiro: *See*—
Nammatsu, Akihiro; Ishii, Mitsuo; and Minezaki, Shigehiro, 5,151,298, Cl. 427-77.000.
Mining Services International Corp.: *See*—
Lownds, Charles M., 5,151,138, Cl. 149-21.000.
Ministry of International Trade and Industry: *See*—
Mitome, Hideto, 5,151,883, Cl. 367-138.000.
Minnesota Mining and Manufacturing Company: *See*—
Bird, Gerald C.; and Hansen, Paul E., 5,150,787, Cl. 206-329.000.
Carpenter, James B.; Doss, Donald G.; and Glatzl, Frank J., 5,151,964, Cl. 385-98.000.
Merry, Richard P.; and Langer, Roger I., 5,151,253, Cl. 422-179.000.
Nelson, John C., 5,150,966, Cl. 362-337.000.
Perrington, Kenneth J.; and Emery, Clair J., 5,151,461, Cl. 524-387.000.
Sanetra, Jurgen; and Schug, Heinrich, 5,151,843, Cl. 361-149.000.
Snead, Wilford A., 5,151,028, Cl. 433-17.000.
Minolta Camera Kabushiki Kaisha: *See*—
Hanamoto, Hiroyuki, 5,152,001, Cl. 395-800.000.
Shimizu, Tadafumi, 5,150,892, Cl. 271-98.000.
Takemoto, Shinichi; Hasegawa, Hirofumi; Toyoshi, Naoki; Oka, Tateki; Goto, Hiroshi; and Yoshida, Narutaka, 5,151,738, Cl. 355-245.000.
Yamashita, Hiroki; and Emori, Kiyoshi, 5,151,735, Cl. 355-207.000.
Minowa, Toshimichi; and Ohyama, Yoshishige, to Hitachi, Ltd. Method and appartaus for controlling driving power of motor vehicle. 5,150,635, Cl. 74-866.000.
Minzenberger, Richard A., to Liquid Carbonic Corporation. Vapor collecting apparatus. 5,150,576, Cl. 62-11.000.
Mirbach, Erich: *See*—
Kaiser, Lutz; Kimmerle, Eugen; Mirbach, Erich; and Notter, Frank, 5,151,041, Cl. 439-157.000.
Mischenko, Nicholas: *See*—
Emmert, Steven C.; Carlson, Kenneth W.; Lundell, Louis J.; Mischenko, Nicholas; Taylor, Terrance N.; and Nagele, Albert L., 5,151,643, Cl. 320-2.000.
Mishima, Akio: *See*—
Sakata, Matsumi; Kumura, Tatsuo; Suzuki, Atsushi; Ikeda, Yoshito; Aoki, Kaoru; Kojima, Naoto; and Mishima, Akio, 5,150,511, Cl. 29-603.000.
Mishler, Frederick H. Gyroscopic device. 5,150,625, Cl. 74-5.00R.
Mr. Coffee, Inc.: *See*—
Cartellone, Mark, 5,150,803, Cl. 215-357.000.
Mita Industrial Co., Ltd.: *See*—
Taguchi, Keiichi, 5,150,889, Cl. 270-53.000.
Mita, Seiichi; Izumita, Morishi; Ide, Hiroshi; Doi, Nobukazu; Okada, Yoshinori; and Inagaki, Yasuo, to Hitachi, Ltd. Automatic equalization method and apparatus. 5,151,924, Cl. 375-12.000.
Mitchell, Kent E., to Phillips Petroleum Company. Method of producing metal halide catalyst. 5,151,397, Cl. 502-107.000.

Mitchell, Mark A.: *See*—
Currie, James H.; Peden, Richard A.; Sczomak, David P.; Mitchell, Mark A.; and Brown, Michael J., 5,150,694, Cl. 123-569.000.
Mitchell, Mark D.; and Spring, David J. System and method for recovering and purifying a halocarbon composition. 5,150,577, Cl. 62-18.000.
Mitchell, Monte K.: *See*—
Burton, Anthony R.; Mitchell, Monte K.; and Hernandez, Raymond, 5,150,751, Cl. 166-81.000.
Mitchell, Muni: *See*—
Sedigh, Mohammad; Shyr, Richard; Shih, Edward; and Mitchell, Muni, 5,151,846, Cl. 361-306.000.
Mito, Kazunori: *See*—
Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, 5,150,922, Cl. 285-21.000.
Mitoh, Yasuo: *See*—
Yanagisawa, Shuichi; Sakai, Tatsuro; Murata, Yasusai; Matsui, Fumio; and Mitoh, Yasuo, 5,151,310, Cl. 428-64.000.
Mitome, Hideto, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Fluid drive method using ultrasonic waves. 5,151,883, Cl. 367-138.000.
Mitsubishi Corporation: *See*—
Yamanashi, Hidenori, 5,151,261, Cl. 423-448.000.
Mitsubishi Denki K.K.: *See*—
Komurasaki, Satoshi, 5,150,606, Cl. 73-35.000.
Kondo, Haruhiko, 5,151,898, Cl. 370-85.150.
Kondo, Katsuhiko, 5,150,695, Cl. 123-571.000.
Oota, Hisasi; and Moritsu, Kazuki, 5,150,578, Cl. 62-47.100.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Deguchi, Mikio; Itagaki, Takushi; and Usui, Masaaki, 5,151,373, Cl. 437-2.000.
Fujita, Akira; and Kato, Hisao, 5,151,562, Cl. 187-134.000.
Fujiwara, Genichi, 5,151,923, Cl. 375-5.000.
Goto, Kenji; Tsukamoto, Manabu; Ishida, Masayuki; and Ishida, Yoshinobu, 5,151,830, Cl. 360-32.000.
Ikeda, Toshio, 5,151,876, Cl. 365-94.000.
Inoue, Akira, 5,151,770, Cl. 357-53.000.
Kawamoto, Satoru; Nakagawa, Noaki; and Hayama, Masahiro, 5,151,806, Cl. 359-59.000.
Mori, Yoshihide; and Shinohara, Takayuki, 5,151,774, Cl. 357-79.000.
Nakanishi, Yasuyuki, 5,151,833, Cl. 360-85.000.
Nakanishi, Yasuyuki, 5,151,835, Cl. 360-96.500.
Sato, Kazuyoshi, 5,152,009, Cl. 455-134.000.
Suematsu, Noriharu; Takagi, Tadashi; and Urasaki, Shuji, 5,151,664, Cl. 330-149.000.
Uenishi, Akio; Yamaguchi, Hiroshi; and Fukumochi, Yasuaki, 5,151,762, Cl. 357-23.400.
Yamazaki, Akira; Kumanoya, Masaki; Konishi, Yasuhiro; and Dosaka, Katsumi, 5,151,614, Cl. 307-272.300.
Mitsubishi Gas Chemical Company, Inc.: *See*—
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Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Danno, Yoshiaki; Togai, Kazuhide; Yoshida, Masato; Ueda, Katsunori; and Shimada, Makoto, 5,151,861, Cl. 364-426.020.
Murata, Shinichi, 5,150,675, Cl. 123-193.500.
Sakurai, Hiromi, 5,151,570, Cl. 219-86.250.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Araki, Yozo; Ito, Isamu; Sugimura, Tohru; Suzuki, Migaku; and Ochi, Mitsuzo, 5,150,562, Cl. 53-438.000.
Ebara, Ryuichiro; Nakamoto, Hideo; Ukawa, Naohiko; Yamada, Tamotsu; and Nishimura, Yasuo, 5,151,248, Cl. 420-35.000.
Seki, Yukuharu; Sasashige, Hiroaki; and Ohkawa, Haruo, 5,150,514, Cl. 29-824.000.
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.
Mitsubishi Kasei Corporation: *See*—
Seiryo, Furuto, 5,151,190, Cl. 210-640.000.
Mitsubishi Materials Corporation: *See*—
Kawaguchi, Akira; Suzuki, Tatsuyuki; and Yoshida, Michihito, 5,151,001, Cl. 414-225.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Hanatani, Tadashi; Sanzen, Satoru; and Deguchi, Jichio, 5,151,324, Cl. 428-323.000.
Mitsubishi Petrochemical Engineering Company Ltd.: *See*—
Nakayama, Naoki; and Hamasaki, Katumi, 5,150,795, Cl. 209-3.300.
Mitsubishi Rayon Co., Ltd.: *See*—
Ikeda, Hiroyuki; Shinka, Michitoshi; Tayama, Suehiro; Sawano, Tetuya; and Saruta, Masahiro, 5,151,482, Cl. 526-329.700.
Mukai, Nobuhiro; Ige, Hitoshi; Makino, Takayuki; and Atarashi, Junko, 5,151,479, Cl. 526-277.000.
Mitsuboshi, Masahiro: *See*—
Ishida, Yuzuru; Inoue, Haruo; Otsuka, Ichiro; Takaku, Masato; Mitsuboshi, Masahiro; Iio, Keiji; and Hashimoto, Atsushi, 5,151,457, Cl. 524-157.000.
Mitsui Petrochemical Ind., Ltd.: *See*—
Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, 5,150,922, Cl. 285-21.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Fukuda, Nobuhiro; Kobayashi, Sadao; Miyachi, Kenji; Takenouchi, Hidemi; Kawahara, Yoji; and Teramoto, Takayuki, 5,151,255, Cl. 422-186.050.
Hayafune, Koji; Naemura, Shinichi; Yasumoto, Hiroshige; and Amemiya, Hideo, 5,151,463, Cl. 524-430.000.
Ishida, Yuzuru; Inoue, Haruo; Otsuka, Ichiro; Takaku, Masato; Mitsuboshi, Masahiro; Iio, Keiji; and Hashimoto, Atsushi, 5,151,457, Cl. 524-157.000.
Miyahara, Shyoichiro; Suzuki, Maki; Shindo, Atsunori; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, 5,151,359, Cl. 435-226.000.
Miura, Toshihide: *See*—
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Miwa, Ikuhisa, to Nippon Thompson Company, Ltd. Ball joint assembly having an extended ball surface. 5,150,981, Cl. 403-122.000.
Miwa, Teiichi: *See*—
Morimoto, Kiyoshi; Iwamoto, Akikazu; Shimizu, Masahiko; Miwa, Teiichi; and Murata, Kazue, 5,150,990, Cl. 406-50.000.
Miyachi, Kenji: *See*—
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Miyagawa, Hideo: *See*—
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Miyahara, Shyoichiro; Suzuki, Maki; Shindo, Atsunori; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, to Mitsui Toatsu Chemicals Incorporated. Method for producing of human tissue type plasminogen activator. 5,151,359, Cl. 435-226.000.
Miyai, Kenji: *See*—
Arai, Hideki; Kawai, Makoto; and Miyai, Kenji, 5,151,254, Cl. 422-180.000.
Miyaji, Masuo: *See*—
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Miyajima, Hisakazu: *See*—
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Miyamoto, Yasunori: *See*—
Idaka, Yukio; Yamaguchi, Shuichiroh; Miyajima, Hisakazu; Matsumoto, Takeshi; and Miyamoto, Yasunori, 5,151,602, Cl. 250-551.000.
Miyanaga, Hirofumi; Sakamoto, Nobuyuki; Yoshimitsu, Koichi; and Tanaka, Yasundo, to Olympus Optical Co., Ltd. Iris diaphragm device and endoscope having the same. 5,150,702, Cl. 128-6.000.
Miyano, Kenmi: *See*—
Kameyama, Shoju; Miyano, Kenmi; Hashimoto, Motonori; Takechi, Kazuo; Ohmura, Takao; Hirao, Yutaka; Uemura, Yahiro; and Yokoyama, Kazumasa, 5,151,499, Cl. 530-381.000.
Miyata, Masahiko, to Fuji Xerox Co., Ltd. System and method employing multiple predictor sets to compress image data having different portions. 5,151,949, Cl. 382-9.000.
Miyata, Shigeo; and Yoshii, Makoto, to Kyowa Chemical Industry. Flame retardant and flame retardant resin composition. 5,151,455, Cl. 523-200.000.
Miyauchi, Katsuki: *See*—
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,151,409, Cl. 505-1.000.
Miyazaki, Akira: *See*—
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Miyazaki, Kenji: *See*—
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Miyazaki, Yasuhiro, to Olympus Optical Co., Ltd. Separation-type optical information recording and reproducing apparatus producing offset-eliminated focus error signal. 5,151,887, Cl. 369-44.320.
Miyazawa, Kazuyuki: *See*—
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000.
Miyazawa, Kenji; and Terao, Hidetoshi, to Koito Manufacturing Co., Ltd. Vehicular headlamp having inclination measuring unit. 5,150,958, Cl. 362-66.000.
Miyazawa, Osamu, to Seiko Epson Corporation. Analog electric timepiece using an intermittent driving signal. 5,151,886, Cl. 368-157.000.
Mizoshita, Yoshifumi: *See*—
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Mizuno, Kyosuke: *See*—
Kuzuhara, Syoji; Odo, Koichi; and Mizuno, Kyosuke, 5,151,023, Cl. 424-89.000.
Mizushima, Katsuhiko: *See*—
Nakayama, Okihiko; Tsuda, Hiroshi; Mizushima, Katsuhiko; Itoh, Toshiyuki; and Ueno, Hiroshi, 5,151,862, Cl. 364-454.000.
Mizutani, Hideo: *See*—
Magome, Nobutaka; Ota, Kazuya; Mizutani, Hideo; and Komatsu, Kouichiro, 5,151,750, Cl. 356-401.000.
Mizutani, Takahiro: *See*—
Tamada, Kenji; Nakajima, Hirokazu; Okayama, Akio; and Mizutani, Takahiro, 5,150,974, Cl. 384-463.000.
Mobil Oil Corporation: *See*—
Chitnis, Girish K.; and Herbst, Joseph A., 5,151,394, Cl. 502-65.000.

Harandi, Mohsen N.; and Owen, Hartley, 5,151,393, Cl. 502-53.000.
Paul, James M.; and Morris, Richard L., 5,151,196, Cl. 210-712.000.
Phelps, Craig H.; and Strom, E. Thomas, 5,150,754, Cl. 166-294.000.

Mobil Solar Energy Corporation: *See*—
Bottari, Frank J.; Hanoka, Jack; and Sylva, Frank W., 5,151,386, Cl. 437-187.000.
Hanoka, Jack I.; and Danielson, Scott E., 5,151,377, Cl. 437-2.000.

Mochida, Ei: *See*—
Inaba, Hitoshi; Nishijima, Kazumi; Kato, Kazuo; Yamamoto, Ichiro; Mochida, Ei; and Ohtomo, Kikuo, 5,151,431, Cl. 514-292.000.

Mochida Pharmaceutical Co., Ltd.: *See*—
Inaba, Hitoshi; Nishijima, Kazumi; Kato, Kazuo; Yamamoto, Ichiro; Mochida, Ei; and Ohtomo, Kikuo, 5,151,431, Cl. 514-292.000.

Moffitt, Robert C.; and Owen, Stephen J., to United Technologies Corporation. Shroud geometry for unmanned aerial vehicles. 5,150,857, Cl. 244-12.200.

Mohr, Wolfgang. Apparatus for severing stacks of sheets. 5,150,647, Cl. 100-90.000.

Molecular Therapetuics, Inc.: *See*—
Salbaum, Johannes M. H.; Masters, Colin L.; and Beyreuter, Konrad T., 5,151,508, Cl. 536-27.000.

Molitor, Robert P.; and Melvin, Terence, to Lisco, Inc. Multi-piece golf balls and methods of manufacture. 5,150,906, Cl. 273-220.000.

Moll, Kenneth P.: *See*—
Knepper, Jonathan D.; and Moll, Kenneth P., 5,150,829, Cl. 228-104.000.

Molleyres, Louis-Pierre, to Ciba-Geigy Corporation. Anthelminitics. 5,151,427, Cl. 514-269.000.

Momont, Timothy W.; and Bird, Charles R., to CTB, Inc. Feeding apparatus. 5,150,666, Cl. 119-57.910.

Momoo, Kazuo: *See*—
Saimi, Tetsuo; and Momoo, Kazuo, 5,151,889, Cl. 369-44.370.

Monaghan, Paul B.: *See*—
Silvenis, Scott A.; Monaghan, Paul B.; Massucco, Arthur A.; Spencer, Richard H.; and Gagne, William R., 5,150,841, Cl. 239-332.000.

Monnet, Olivier; and Vacher, Jacques, to Commissariat a l'Energie Atomique. Device to display disintegrations of positrons using barycentric and time of flight measurements. 5,151,599, Cl. 250-363.030.

Mononen, Pirjo: *See*—
Osterholm, Jan-Erik; Laakso, Jukka; Karjalainen, Sari; and Mononen, Pirjo, 5,151,221, Cl. 252-500.000.

Monshizadegan, Hossain: *See*—
Webb, Maria L.; and Monshizadegan, Hossain, 5,151,502, Cl. 530-402.000.

Montgomery, Eda R.; and King, Randal D., to McGean-Rohco, Inc. Acid copper electroplating bath containing brightening additive. 5,151,170, Cl. 205-298.000.

Moody, Victor; and Jenner, Andrew, to Frank's International Ltd. Device for applying torque to a tubular member. 5,150,642, Cl. 81-57.200.

Moore, Jack S., Jr.; Cox, Johnny R.; and Williams, Mark L., to Eastman Kodak Company. Apparatus for collecting samples of articles conveyed at high speed in consecutive order. 5,150,621, Cl. 73-863.910.

Moore, Jerry H., to United Technologies Corporation. Blade lock for a rotor disk and rotor blade assembly. 5,151,013, Cl. 416-221.000.

Moorman, Thomas P.: *See*—
Abraham, Robert L.; Priven, Michael P.; and Moorman, Thomas P., 5,151,987, Cl. 395-575.000.

MOR/ryde International, Inc.: *See*—
Heitzmann, David E., 5,150,918, Cl. 280-716.000.

Moreland, Jack, to MPC Containment Systems, Ltd. Method of manufacturing large scale membranes for covering extremely large areas. 5,150,510, Cl. 29-525.100.

Morgan, A. Charles, Jr.; and Pavanasasivam, Gowsala, to NeoRx Corporation. Use of anionic detergents with conjugates of monoclonal or polyclonal antibodies. 5,151,266, Cl. 424-85.800.

Morgan, Dennis J.: *See*—
Herndon, James F.; and Morgan, Dennis J., 5,151,225, Cl. 252-607.000.

Morgan, Robert W., to Siemens Energy & Automation, Inc. Electrical power distribution busway with isolated ground bus. 5,151,043, Cl. 439-212.000.

Mori, Fumitoshi: *See*—
Taniguchi, Yoshiaki; Watanabe, Masaki; Iizawa, Ryuji; and Mori, Fumitoshi, 5,151,860, Cl. 364-424.050.

Mori, Tatsushi; Kobayashi, Hisao; and Izumi, Yuji, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Scroll type compressor having gradually thinned wall thickness. 5,151,020, Cl. 418-55.200.

Mori, Yoshihide; and Shinohara, Takayuki, to Mitsubishi Denki Kabushiki Kaisha. Portable semiconductor data storage device with disconnectable ground connection. 5,151,774, Cl. 357-79.000.

Mori, Yoshiteru: *See*—
Kunikawa, Norihide; Yamada, Yoshikado; Mori, Yoshiteru; and Matsuo, Toshihisa, 5,150,890, Cl. 271-9.000.

Morikuni, Mitsuru: *See*—
Nishiyama, Yoshinori; Yanagita, Tomoatsu; Nagai, Masahiko; Morikuni, Mitsuru; and Matsumoto, Kenji, 5,151,868, Cl. 364-490.000.

Morimoto, Kiyoshi; Iwamoto, Akikazu; Shimizu, Masahiko: Miwa, Teiichi; and Murata, Kazue, to Kabushiki Kaisha Matsui Seisakusho. High density pneumatic transport system for use with solid materials. 5,150,990, Cl. 406-50.000.

Morimoto, Takuo: *See*—
Yuki, Syoji; Tokui, Yasuyuki; Nishiuchi, Kihachiro; Wada, Kenichi; Suzue, Masayoshi; and Morimoto, Takuo, 5,150,905, Cl. 273-218.000.

Morita, Misao: *See*—
Nakajima, Takashi, deceased; and Morita, Misao, 5,151,751, Cl. 356-402.000.

Morita, Yoshiharu; Chaki, Haruyuki; Hoshide, Yasuo; and Takashima, Junko, to Merck & Co., Inc. 1-aminoethyl phosphonic acid derivatives. 5,151,521, Cl. 548-112.000.

Moritsu, Kazuki: *See*—
Oota, Hisasi; and Moritsu, Kazuki, 5,150,578, Cl. 62-47.100.

Moriyama, Yoshiaki, to Pioneer Electronic Corporation. Data converting apparatus. 5,151,699, Cl. 341-58.000.

Moriyama, Yoshiaki; and Kobayashi, Satomi, to Pioneer Electronic Corporation. Efficient encoding of picture signal. 5,151,791, Cl. 358-261.200.

Morrin, Hugh F. C.: *See*—
Hvezda, Jaroslav M.; Fisher, Robert W.; Olszewski, Edward J.; Morrin, Hugh F. C.; and Glover, Richard J., 5,151,961, Cl. 385-60.000.

Morris, John R., Jr.: *See*—
Degani, Yinon; and Morris, John R., Jr., 5,150,832, Cl. 228-224.000.

Morris, Richard L.: *See*—
Paul, James M.; and Morris, Richard L., 5,151,196, Cl. 210-712.000.

Morris, Robert L.; and Bartos, Andrew L., to General Motors Corporation. Electro-mechanical power controller for a gear shift mechanism. 5,150,629, Cl. 74-337.500.

Morrison, Donald J.; McGregor, David; and McCrae, James M., to Ciba-Geigy Corporation. Process for the production of pigments in the presence of an azo dyestuff. 5,151,129, Cl. 106-623.000.

Moschuering, Hugo, to Siemens Aktiengesellschaft. Measuring position for microwave components. 5,151,652, Cl. 324-158.00P.

Moskowitz, Larry N.; and Lindley, Donald J., to Amoco Corporation. High density thermal spray coating. 5,151,308, Cl. 428-35.800.

Mosquera, Rene A., to ITT Corporation. Connector latching arrangement. 5,151,049, Cl. 439-353.000.

Moss, Bernard: *See*—
Kotwal, Girish J.; and Moss, Bernard, 5,151,509, Cl. 536-27.000.

Moss, Gary L.: *See*—
Zey, Edward G.; Shockley, Thomas H.; Ryan, Debra A.; and Moss, Gary L., 5,151,551, Cl. 562-494.000.

Motohashi, Toshiaki; Harada, Yooichi; and Yanagihara, Tsuyoshi, to Tokyo Tatsuno Co., Ltd. Vapor recovering device for volatile liquid dispensing apparatus. 5,150,742, Cl. 141-59.000.

Motorola, Inc.: *See*—
Balzano, Quirino; and Stengel, Robert E., 5,151,709, Cl. 343-741.000.
Bickley, Robert H., 5,152,005, Cl. 455-76.000.
Emmert, Steven C.; Carlson, Kenneth W.; Lundell, Louis J.; Mischenko, Nicholas; Taylor, Terrance N.; and Nagele, Albert L., 5,151,643, Cl. 320-2.000.
Frisbie, Milo W.; Nickerson, Larry A.; and Swapp, Mavin C., 5,151,650, Cl. 324-158.00F.
Hanna, John E., 5,151,662, Cl. 328-127.000.
Hsueh, Paul W.; and Smith, Douglas D., 5,151,879, Cl. 365-190.000.
Klaus, Thomas R., 5,152,006, Cl. 455-89.000.
Langan, John A.; and Sibigtroth, James M., 5,151,986, Cl. 395-550.000.
Uribe, Juan R., 5,152,007, Cl. 455-116.000.
Weiss, Karl R., 5,151,922, Cl. 375-5.000.

Moulinex (Societe Anonyme): *See*—
Schiettecatte, Patrice J. C., 5,150,645, Cl. 99-295.000.

Mouri, Akihiro: *See*—
Arahara, Kohzoh; Yuasa, Toshiya; Kai, Takashi; Tohyama, Noboru; Mouri, Akihiro; and Matsumoto, Kenichi, 5,151,712, Cl. 346-1.100.

MPC Containment Systems, Ltd.: *See*—
Moreland, Jack, 5,150,510, Cl. 29-525.100.

MTU Motoren- Und Turbinen-Union Munchen GmbH: *See*—
Herzog, Claus, 5,150,571, Cl. 60-200.100.

Muckenfuhs, Delmar R., to Procter & Gamble Company, The. Method for making side opening flexible bag with longitudinally oriented carrying handle secured to side panels. 5,150,561, Cl. 53-412.000.

Mueller, Franz-Josef: *See*—
Joerg, Klaus; Kummer, Rudolf; and Mueller, Franz-Josef, 5,151,541, Cl. 558-277.000.

Mueller, Gustav; and Stoll, Lothar, to Siemens Aktiengesellschaft. Controllable integrated optical Mach-Zehnder interferometer. 5,151,959, Cl. 385-50.000.

Mueller, Stefan; Theobald, Hans; Wolf, Bernd; Hofmeister, Peter; Kardorff, Uwe; and Kuenast, Christoph, to BASF Aktiengesellschaft. 3-isoxazolylbenzyl esters, their preparation and their use. 5,151,441, Cl. 514-378.000.

Mukai, Nobuhiro; Ige, Hitoshi; Makino, Takayuki; and Atarashi, Junko, to Mitsubishi Rayon Co., Ltd. Dental adhesive composition. 5,151,479, Cl. 526-277.000.

Mukai, Toshio; Yamashita, Yoshiro; and Suzuki, Takanori, to Fuji Xerox Co., Ltd.; and Mukai, Toshio. Charge transfer complex formed between benzoquinone derivative and electron donor and process for producing the same. 5,151,528, Cl. 549-31.000.

Mukainakano, Hiroshi: *See*—
Machida, Satoshi; Kawahara, Yukito; and Mukainakano, Hiroshi, 5,151,587, Cl. 250-208.100.

Mulhaupt, Rolf: *See—*
Strasilla, Dieter; Stossel, Richard; Mulhaupt, Rolf; and Kreibich, Ursula, 5,151,318, Cl. 428-246.000.

Mullally, Michael J., to Valve Tech, Inc. Thruster valve. 5,150,879, Cl. 251-129.210.

Muller, Hartmut: *See—*
Smith, Hylton H.; Huber, Hans F.; and Muller, Hartmut, 5,151,493, Cl. 528-272.000.

Muller, Karl-Heinz, to GKN Automotive AG. Continuous tensioning ring for mounting convoluted boots. 5,150,503, Cl. 24-20.0EE.

Muller, Klaus; and Kulhanek, Antonin, to Honda Giken Kogyo Kabushiki Kaisha. Rechargeable storage battery with electroactive organic polymer electrodes in polar solvent electrolyte. 5,151,162, Cl. 294-131.000.

Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, to Bayer Aktiengesellschaft. Herbicidal substituted 4-sulphonylamino-2-azinyl-1,2,4-triazol-3-ones. 5,151,514, Cl. 544-212.000.

Muller, Michael: *See—*
Podszun, Wolfgang; Muller, Michael; Cramer, Wilfried; and Rehbold, Bodo, 5,151,480, Cl. 526-279.000.

Muller, Richard P.: *See—*
Grossi, Benedetto; and Muller, Richard P., 5,151,101, Cl. 606-46.000.

Muller, Walter, to Ewikon Entwicklung und Konstruktion GmbH & Co. KG. Electrically heatable nozzle for an injection molding machine, a hot runner system or the like. 5,151,025, Cl. 425-199.000.

Munday, Jerry T.; and Meiss, Theodore D., to Hoechst Celanese Corporation. Flame resistant, low pilling polyester fiber. 5,151,494, Cl. 528-287.000.

Munroe, David M. Display device for coin certification encasements. 5,150,792, Cl. 206-486.000.

Murakami, Aiko: *See—*
Arahori, Hideo; Yamazaki, Shiro; Arahira, Masato; and Murakami, Aiko, 5,151,114, Cl. 71-92.000.

Murakami Kaimeido Co., Ltd.: *See—*
Sugimura, Naomi, 5,151,828, Cl. 359-871.000.

Murakami, Kiyokazu; and Yokura, Susumu, to Tokyo Tanabe Company, Limited. Antiulcer substance. 5,151,450, Cl. 514-690.000.

Murakami, Koichi; Matsuo, Kazuhiro; Iizumi, Kenichi; and Tagawa, Yoichi, to Canon Kabushiki Kaisha; and Daiichi Seiki Kaisha Kabushiki Kaisha. Sheet binder. 5,150,998, Cl. 412-14.000.

Murakami, Masaaki: *See—*
Matsumura, Kimiharu; Sakai, Hiroyuki; Murakami, Masaaki; Oda, Tetsuya; and Yamaguchi, Chizo, 5,151,871, Cl. 364-557.000.

Murakami, Toshifumi: *See—*
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.

Murakami, Yoshichika. Cleaner for rotary bodies such as blanket cylinder, impression cylinder, ink supply rollers and the like. 5,150,650, Cl. 101-425.000.

Muraki, Toshio: *See—*
Kimoto, Yukitane; Murata, Kohzou; and Muraki, Toshio, 5,151,322, Cl. 428-303.000.

Muramatsu, Shigeki; Takasugi, Shinji; and Osato, Kazumi, to Chinetsu Gijutsu Kaihatsu Kabushiki Kaisha. Three-dimensional detection system for detecting fractures and their distributions in the earth crust utilizing an artificial magnetic field and magnetic particle tracer. 5,151,658, Cl. 324-346.000.

Muramoto, Hisao: *See—*
Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiro; Hirashima, Isao; and Ushijima, Kazuhiro, 5,150,919, Cl. 280-732.000.

Muranaka, Masaya: *See—*
Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, 5,151,772, Cl. 357-71.000.

Murata, Kazue: *See—*
Morimoto, Kiyoshi; Iwamoto, Akikazu; Shimizu, Masahiko; Miwa, Teiichi; and Murata, Kazue, 5,150,990, Cl. 406-50.000.

Murata, Kazushige: *See—*
Ito, Takeshi; and Murata, Kazushige, 5,151,275, Cl. 425-84.000.

Murata, Kohzou: *See—*
Kimoto, Yukitane; Murata, Kohzou; and Muraki, Toshio, 5,151,322, Cl. 428-303.000.

Murata Manufacturing Co.: *See—*
Noto, Kazuyuki; and Toyoshima, Isao, 5,151,672, Cl. 333-189.000.

Murata, Shinichi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Cylinder head assembly for use in internal combustion engine. 5,150,675, Cl. 123-193.500.

Murata, Yasushi: *See—*
Yanagisawa, Shuichi; Sakai, Tatsuro; Murata, Yasushi; Matsui, Fumio; and Mitoh, Yasuo, 5,151,310, Cl. 428-64.000.

Murata, Yukio, to NEC Corporation. Charge device capable of lengthening a lifetime of a storage cell. 5,151,645, Cl. 320-23.000.

Murphy, James V., to Advanced Interconnections Corporation. Integrated circuit adapter having gullwing-shaped leads. 5,151,039, Cl. 439-70.000.

Mycogen Corporation: *See—*
Payne, Jewel M., 5,151,363, Cl. 435-252.500.

Mydill, Marc R.; and O'Keefe, Sheila, to Texas Instruments Incorporated. High efficiency pattern sequence controller for automatic test equipment. 5,151,903, Cl. 371-27.000.

Myer, John M.: *See—*
Cravens, David M.; Denlinger, Keith R.; Gryzbowski, Richard W.; and Myer, John M., 5,151,045, Cl. 439-271.000.

Myers, Bruce A.: *See—*
Akin, Timur; Myers, Bruce A.; Maki, William M.; and Palanisamy, Ponnusamy, 5,151,777, Cl. 357-81.000.

Myers, Dean E., to MAC Tools, Inc. Auxiliary starter switch with illuminated guard. 5,150,610, Cl. 73-118.100.

Myers, Frederick A.: *See—*
Robbins, Douglas J.; Gosselin, Cynthia A.; and Myers, Frederick A., 5,151,297, Cl. 427-46.000.

Myslicki, Robert J.; Khalid, Hecham R.; and Aubry, Michael E., to General Motors Corporation. Latch having torsion spring leg and leaf spring leg. 5,150,933, Cl. 292-216.000.

Naemura, Shinichi: *See—*
Hayafune, Koji; Naemura, Shinichi; Yasumoto, Hiroshige; and Amemiya, Hideo, 5,151,463, Cl. 524-430.000.

Nagae, Akihito, to Kabushiki Kaisha Toshiba. Personal computer for cutting off power when a lock mechanism of hard disk pack is released. 5,151,992, Cl. 395-750.000.

Nagai, Masahiko: *See—*
Nishiyama, Yoshinori; Yanagita, Tomoatsu; Nagai, Masahiko; Morikuni, Mitsuru; and Matsumoto, Kenji, 5,151,868, Cl. 364-490.000.

Nagamine, Akira, to AMP Incorporated. Connector latch with anti-overstress. 5,151,051, Cl. 439-557.000.

Nagasawa, Takeshi: *See—*
Kuroiwa, Katsumasa; Katayama, Katsuhiro; Miura, Toshihide; and Nagasawa, Takeshi, 5,151,372, Cl. 436-164.000.

Nagasawa, Tsuyoshi, to Sony Corporation. Tape loading device. 5,151,832, Cl. 360-85.000.

Nagase, Toshikatu: *See—*
Kumaki, Tuneo; Nagase, Toshikatu; and Shichijo, Yasuhisa, 5,150,649, Cl. 101-365.000.

Nagata, Seiichi: *See—*
Takeda, Etsuya; Nanno, Yutaka; and Nagata, Seiichi, 5,151,805, Cl. 359-57.000.

Nagatani, Fumio: *See—*
Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, 5,150,922, Cl. 285-21.000.

Nagatsuka, Sumiya; Takeuchi, Hiroshi; and Karasawa, Haruo, to Konica Corporation. Method and apparatus for processing radiation image. 5,151,947, Cl. 382-6.000.

Nagayasu, Takayoshi: *See—*
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000.

Nagele, Albert L.: *See—*
Emmert, Steven C.; Carlson, Kenneth W.; Lundell, Louis J.; Mischenko, Nicholas; Taylor, Terrance N.; and Nagele, Albert L., 5,151,643, Cl. 320-2.000.

Nagengast, William E.; and Filosa, Philip C., to General Motors Corporation. Headlamp leveling arrangement. 5,151,849, Cl. 362-61.000.

Naismith, Robert: *See—*
Thornthwaite, John B.; and Naismith, Robert, 5,151,232, Cl. 264-130.000.

Nakagaki, Shintaro: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; and Uchiyama, Yuji, 5,151,781, Cl. 358-45.000.

Nakagawa, Hiroshi: *See—*
Asano, Koin; Tagawa, Kenichi; Nakagawa, Hiroshi; and Wakahara, Hiroyuki, 5,151,240, Cl. 264-284.000.

Nakagawa, Noaki: *See—*
Kawamoto, Satoru; Nakagawa, Noaki; and Hayama, Masahiro, 5,151,806, Cl. 359-59.000.

Nakagawa, Takashi: *See—*
Shigematsu, Kazuyoshi; Nakagawa, Takashi; and Sakamoto, Shuji, 5,151,531, Cl. 552-115.000.

Nakagawa, Yasuo; and Nayer, Shree K., to Hitachi, Ltd. Method of detecting solid shape of object with autofocusing and image detection at each focus level. 5,151,609, Cl. 250-561.000.

Nakahara, Takashi: *See—*
Shikichi, Satoshi; and Nakahara, Takashi, 5,151,888, Cl. 369-44.320.

Nakahata, Kimio: *See—*
Ohzeki, Yukihiro; Araya, Junji; Ishiyama, Tatsunori; Sato, Yasushi; and Nakahata, Kimio, 5,151,736, Cl. 355-208.000.

Nakajima, Hajime: *See—*
Yamada, Toshiyuki; Takahama, Yoshihiro; Kurihara, Kazushige; and Nakajima, Hajime, 5,150,556, Cl. 52-639.000.

Nakajima, Hirokazu: *See—*
Tamada, Kenji; Nakajima, Hirokazu; Okayama, Akio; and Mizutani, Takahiro, 5,150,974, Cl. 384-463.000.

Nakajima, Ichiro; Hatakeyama, Kazuya; and Hirata, Yasushi, to Bridgestone Corporation. Low heat generation rubber compositions containing thiadiazole compound. 5,151,468, Cl. 525-332.700.

Nakajima, Satoko, legal representative: *See—*
Nakajima, Takashi, deceased; and Morita, Misao, 5,151,751, Cl. 356-402.000.

Nakajima, Takashi, deceased (by Nakajima, Satoko, legal representative); and Morita, Misao, to Nippon Paint Co., Ltd. Method for

evaluating color tone of coating film and device for this evaluation. 5,151,751, Cl. 356-402.000.

Nakamichi Corporation: *See*—
Narusawa, Hitoshi; and Yoneda, Michiaki, 5,151,831, Cl. 360-39.000.

Nakamoto, Hideo: *See*—
Ebara, Ryuichiro; Nakamoto, Hideo; Ukawa, Naohiko; Yamada, Tamotsu; and Nishimura, Yasuo, 5,151,248, Cl. 420-35.000.

Nakamura, Eitaro: *See*—
Kitahara, Shizuo; Nakamura, Eitaro; and Kubo, Yoichiro, 5,151,333, Cl. 428-694.000.

Nakamura, Hideki, to Terumo Kabushiki Kaisha. Method for optical determination of concentration of substance and apparatus for the determination. 5,151,603, Cl. 250-458.100.

Nakamura, Koki: *See*—
Koide, Tomoyuki; Matsuda, Naoto; Nakamura, Koki; and Kojima, Tetsuro, 5,151,357, Cl. 430-610.000.

Nakamura, Noriyuki: *See*—
Ohta, Hiroshi; and Nakamura, Noriyuki, 5,151,955, Cl. 385-6.000.

Nakamura, Takaharu: *See*—
Sasho, Manabu; Yamauchi, Hiroshi; Yamanaka, Motosuke; Nakamura, Takaharu; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; and Negi, Shigeto, 5,151,417, Cl. 514-202.000.

Nakamura, Takeshi: *See*—
Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000.

Nakane, Hideaki: *See*—
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,151,409, Cl. 505-1.000.

Nakanishi, Hidenori: *See*—
Tanaka, Saburo; Nakanishi, Hidenori; and Itozaki, Hideo, 5,151,408, Cl. 505-1.000.

Nakanishi, Kunio: *See*—
Tani, Masayuki; Nakanishi, Kunio; Kawabata, Atsushi; Watanabe, Norito; Yokoyama, Takanori; and Tanifuji, Shinya, 5,151,974, Cl. 395-128.000.

Nakanishi, Yasuyuki, to Mitsubishi Denki Kabushiki Kaisha. Magnetic tape device having a switching mechanism for diverting rotation of the capstan to rotation for loading/unloading a cassette in the device. 5,151,833, Cl. 360-85.000.

Nakanishi, Yasuyuki, to Mitsubishi Denki Kabushiki Kaisha. Cassette detecting device for cassette loading mechanism. 5,151,835, Cl. 360-96.500.

Nakano, Hirofumi; Kawada, Shozo; Uosaki, Yoichi; Saito, Yutaka; Gomi, Katsushige; and Iwazaki, Toshiaki, to Kyowa Hakko Kogyo Co., Ltd. Process for producing diterpene compounds. 5,151,352, Cl. 435-123.000.

Nakano, Toshio: *See*—
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.

Nakano, Yasushi: *See*—
Kawahara, Setsuko; Nakano, Yasushi; and Koyama, Noboru, 5,151,323, Cl. 428-323.000.

Nakaoka, Mikio: *See*—
Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, 5,150,922, Cl. 285-21.000.

Nakase, Kazuhiko; and Kawasaki, Moriyoshi, to Harada Kogyo Kabushiki Kaisha. Shortened mast antenna with compensating circuits. 5,151,708, Cl. 343-722.000.

Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, to Osaka Gas Co., Ltd.; Mitsui Petrochemical Ind., Ltd.; and Shinwa Sangyo Co., Ltd. Electrofusion joint and hot water supply header using the same. 5,150,922, Cl. 285-21.000.

Nakayama, Naoki; and Hamasaki, Katumi, to Mitsubishi Petrochemical Engineering Company Ltd. Apparatus for sorting specimens. 5,150,795, Cl. 209-3.300.

Nakayama, Okihiko; Tsuda, Hiroshi; Mizushima, Katsuhiko; Itoh, Toshiyuki; and Ueno, Hiroshi, to Nissan Motor Company, Ltd. Vehicular traveling direction measuring system. 5,151,862, Cl. 364-454.000.

Nakazato, Hiroshi: *See*—
Tanaka, Shoji; Tsujimoto, Masafumi; Wada, Yayoi; Tsuruoka, Nobuo; and Nakazato, Hiroshi, 5,151,349, Cl. 435-69.100.

Nalco Chemical Company: *See*—
Majestic, Veronica K.; and Strong, Russell C., 5,151,220, Cl. 252-392.000.

Nammatsu, Akihiro; Ishii, Mitsuo; and Minezaki, Shigehiro, to Sharp Kabushiki Kaisha. Process for preparing orientation film for liquid crystals. 5,151,298, Cl. 427-77.000.

Nanba, Ryujiro: *See*—
Takamoto, Ryuichi; Nanba, Ryujiro; Matsuoka, Masahiro; and Sawada, Tsuguo, 5,151,590, Cl. 250-215.000.

Nanno, Yutaka: *See*—
Takeda, Etsuya; Nanno, Yutaka; and Nagata, Seiichi, 5,151,805, Cl. 359-57.000.

Narang, Subhash C.: *See*—
Madou, Marc J.; Narang, Subhash C.; Otagawa, Takaaki; and Wing, Sharon, 5,151,224, Cl. 252-586.000.

Nardella, Paul C.: *See*—
Abele, John E.; Lennox, Charles E.; Nardella, Paul C.; and Joshi, Sharad H., 5,151,100, Cl. 606-28.000.

Narita, Ryoichi: *See*—
Kondo, Munenari; Imai, Masahito; Narita, Ryoichi; and Maeda, Takushi, 5,150,616, Cl. 73-517.00R.

Nartron Corporation: *See*—
Rymut, Michael J.; Cooper, Stephen R. W.; and Washeleski, John M., 5,150,615, Cl. 73-313.000.

Narusawa, Hitoshi; and Yoneda, Michiaki, to Nakamichi Corporation. Digital signal processing circuit. 5,151,831, Cl. 360-39.000.

National Research Development Corporation: *See*—
Earl, Harold A.; and Banks, William B., 5,151,238, Cl. 264-136.000.

National Semiconductor Corporation: *See*—
Ramde, Amolak R., 5,151,378, Cl. 437-31.000.

Navarro, Thomas L.; and Isaacson, James D. Apparatus with rotatably-driven asymmetrically-accelerated eccentric mass for generating translational force. 5,150,626, Cl. 74-84.00R.

Nayer, Shree K.: *See*—
Nakagawa, Yasuo; and Nayer, Shree K., 5,151,609, Cl. 250-561.000.

NCR Corporation: *See*—
Haagh, Johannes P. N.; van Driest, Hans; and Smit, Gerrit, 5,151,920, Cl. 375-1.000.

NEC Corporation: *See*—
Goto, Hiroyuki, 5,151,621, Cl. 307-475.000.
Hori, Tsuguo, 5,152,008, Cl. 455-127.000.
Kimura, Yasuo, 5,151,892, Cl. 369-109.000.
Komuro, Toshio, 5,151,616, Cl. 307-451.000.
Murata, Yukio, 5,151,645, Cl. 320-23.000.
Nishijima, Kazunori, 5,151,667, Cl. 331-117.00R.
Takai, Kazuhito; and Kimura, Yukihiro, 5,151,954, Cl. 382-41.000.
Tamagawa, Akio, 5,151,666, Cl. 331-64.000.
Ueno, Yoshiyasu, 5,151,913, Cl. 372-46.000.
Yamahata, Hitoshi, 5,151,993, Cl. 395-775.000.
Yamasaki, Koji, 5,151,680, Cl. 340-384.00E.
Yamasaki, Koji, 5,151,694, Cl. 340-825.440.
Yamazaki, Atsushi, 5,151,980, Cl. 395-375.000.

Neckers, Douglas C.: *See*—
Gottschalk, Peter; Neckers, Douglas C.; and Schuster, Gary B., 5,151,520, Cl. 548-110.000.

Negi, Shigeto: *See*—
Sasho, Manabu; Yamauchi, Hiroshi; Yamanaka, Motosuke; Nakamura, Takaharu; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; and Negi, Shigeto, 5,151,417, Cl. 514-202.000.

Negi, Yoshitaka; and Matsuura, Hiroshi, to Fujikiko Kabushiki Kaisha. Vehicle seat. 5,150,871, Cl. 248-429.000.

Negoto, Hidenori: *See*—
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000.

Neilson, Demont: *See*—
Neilson, Jim L.; and Neilson, Demont, 5,150,967, Cl. 366-206.000.

Neilson, Jim L.; and Neilson, Demont, to Neilson, Jim L.; and Neilson, Josefa N. Milkshake machine. 5,150,967, Cl. 366-206.000.

Neilson, Josefa N.: *See*—
Neilson, Jim L.; and Neilson, Demont, 5,150,967, Cl. 366-206.000.

Nelson, John C., to Minnesota Mining and Manufacturing Company. Uniform intensity profile catadioptric lens. 5,150,966, Cl. 362-337.000.

Nelson, William E., to Texas Instruments Incorporated. System and method for solid state illumination for DMD devices. 5,151,718, Cl. 346-160.000.

Nemas, Mara: *See*—
Perry, Mordechai; Yacubowicz, Henia; Linder, Charles; Nemas, Mara; and Katraro, Reuven, 5,151,182, Cl. 210-500.270.

Neng-Shi (Hong Kong) Industrial Co.: *See*—
Yuan, Gu F.; Yuen, Kou M.; Wei, Zhao Q.; and Ying, Gu Z., 5,150,488, Cl. 7-137.000.

Neoprobe Corporation: *See*—
Denen, Dennis J., 5,151,598, Cl. 250-336.100.

NeoRx Corporation: *See*—
Morgan, A. Charles, Jr.; and Pavanasasivam, Gowsala, 5,151,266, Cl. 424-85.800.

Nepote, Andrea; and Boella, Marcello, to Marelli Autronica SpA. Device for controlling a gas-discharge lamp for use in a motor vehicle. 5,151,634, Cl. 315-307.000.

Neskora, Dan R.: *See*—
Vaughn, Stephen N.; Siskin, Michael; Katritzky, Alan; Brons, Glen; Reynolds, Steve N.; Culross, Claude C.; and Neskora, Dan R., 5,151,173, Cl. 208-430.000.

Nestec S.A.: *See*—
Fasi, Roland; and Nielsen, Milo A., 5,151,503, Cl. 530-412.000.
Poulin, Jean-Marc; and Schmidely, Herve , 5,151,199, Cl. 210-773.000.
Schlecht, Klaus; and Wehrspann, Olaf, 5,151,287, Cl. 426-432.000.

Netsu, Toshitada: *See*—
Matsui, Kiyoshi; Satoh, Ryohei; Netsu, Toshitada; Sasaki, Hideaki; Shirai, Mitugu; and Hamamura, Kenichi, 5,151,773, Cl. 357-74.000.

Nettelbladt, Hans K.; and Widman, Karl M., to Asea Brown Boveri AB. Surface emitting heterojunction light emitting diode. 5,151,756, Cl. 357-17.000.

Neward, Theodore C. Spiral electrode with contact retainer. 5,150,709, Cl. 128-642.000.

Newman, William C.; Titchener, Paul F.; and Powell, Douglas B. Block diagram simulator using a library for generation of a computer program. 5,151,984, Cl. 395-500.000.

Nguyen-Ba, Nghe: *See*—
Belleau, Bernard; and Nguyen-Ba, Nghe, 5,151,426, Cl. 514-262.000.

Nguyen, Frederique: *See*—
Samain, Daniel; Bec, Jean-Louis; Cohen, Edith; Nguyen, Frederique; and Peyrot, Marianne, 5,151,264, Cl. 424-1.100.

Nguygen, Thanh D.; and Hubby, Christopher M., to W. R. Grace & Co.-Conn. Process for continuous spinning of hollow-fiber membranes using a solvent mixture as a precipitation medium. 5,151,227, Cl. 264-41.000.

Nichidai Industrial Co. Ltd.: *See*—
Sakai, Hideyuki, 5,150,655, Cl. 104-89.000.

Nichols, Richard E. D. Holster with retention device. 5,150,825, Cl. 224-243.000.

Nickerson, Larry A.: *See*—
Frisbie, Milo W.; Nickerson, Larry A.; and Swapp, Mavin C., 5,151,650, Cl. 324-158.00F.

Nickerson, Mark A.; Poole, John S.; and Frank, Lenore G. R., to Hewlett-Packard Company. Axially-driven valve controlled trapping assembly. 5,151,178, Cl. 210-198.200.

Nicolas, Christophe, to Thomson-CSF. Device for the generation of several beams of light including a light splitter. 5,151,825, Cl. 359-634.000.

Niedajkasza, Bruno: *See*—
Niedajkasza, Mauricette; Niedajkasza, Bruno; and Niedajkasza, Catherine, 5,150,478, Cl. 2-243.00R.

Niedajkasza, Catherine: *See*—
Niedajkasza, Mauricette; Niedajkasza, Bruno; and Niedajkasza, Catherine, 5,150,478, Cl. 2-243.00R.

Niedajkasza, Mauricette; Niedajkasza, Bruno; and Niedajkasza, Catherine, to Niedajkasza, Mauricette. Method for the production of modulable garments. 5,150,478, Cl. 2-243.00R.

Nielsen, Milo A.: *See*—
Fasi, Roland; and Nielsen, Milo A., 5,151,503, Cl. 530-412.000.

Nikon Corporation: *See*—
Magome, Nobutaka; Ota, Kazuya; Mizutani, Hideo; and Komatsu, Kouichiro, 5,151,750, Cl. 356-401.000.
Takayama, Toru, 5,151,729, Cl. 354-195.120.
Tanimoto, Akikazu; and Kamiya, Saburo, 5,151,749, Cl. 356-375.000.

Ninomiya, Hiroshi; and Fujikawa, Satoshi, to Mazda Motor Corporation. Transfer case shifting apparatus for four wheel drive vehicle. 5,150,637, Cl. 74-335.000.

Nippon A B S Ltd.: *See*—
Arikawa, Tetsuro; and Abe, Toshiyuki, 5,150,950, Cl. 303-100.000.

Nippon CMK Corp.: *See*—
Itsuji, Junichi, 5,151,299, Cl. 427-96.000.
Itsuji, Junichi, 5,151,300, Cl. 427-96.000.

Nippon Hoso Kyokai: *See*—
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

Nippon Mektron, Limited: *See*—
Abe, Masatoshi; and Tatsu, Haruyoshi, 5,151,492, Cl. 526-206.000.

Nippon Paint Co., Ltd.: *See*—
Kuwajima, Teruaki; Umeda, Shinichiro; Watanabe, Masakazu; and Konishi, Sakuichi, 5,151,125, Cl. 106-503.000.
Nakajima, Takashi, deceased; and Morita, Misao, 5,151,751, Cl. 356-402.000.

Nippon Steel Corp.: *See*—
Uchida, Takayuki; Ide, Satoshi; Yamamoto, Masahiro; and Yumoto, Atsushi, 5,150,598, Cl. 72-325.000.

Nippon Telegraph and Telephone Corporation: *See*—
Enoki, Takatomo; Shigekawa, Naoteru; and Arai, Kunihiro, 5,151,757, Cl. 357-22.000.
Onoe, Seizo; and Umeda, Narumi, 5,151,693, Cl. 340-825.300.

Nippon Thompson Company, Ltd.: *See*—
Miwa, Ikuhisa, 5,150,981, Cl. 403-122.000.

Nippon Zeon Co., Ltd: *See*—
Kitahara, Shizuo; Nakamura, Eitaro; and Kubo, Yoichiro, 5,151,333, Cl. 428-694.000.

Nippondenso Co., Ltd.: *See*—
Kondo, Munenari; Imai, Masahito; Narita, Ryoichi; and Maeda, Takushi, 5,150,616, Cl. 73-517.00R.
Suzuki, Yasutoshi; Awano, Namoi; Hoshino, Kouichi; and Inuzuka, Hajime, 5,151,764, Cl. 357-27.000.

Nishida, Jun: *See*—
Ishibashi, Yoriyuki; Hirano, Ryoichi; and Nishida, Jun, 5,151,754, Cl. 356-356.000.

Nishiguchi, Masayuki; Fujiwara, Yoshihito; and Umezawa, Tomoko, to Sony Corporation. Digital signal encoding apparatus. 5,151,941, Cl. 381-46.000.

Nishiguchi, Yukihiro. Microcomputer system with selectively bypassed memory output latches. 5,151,983, Cl. 395-425.000.

Nishijima, Kazumi: *See*—
Inaba, Hitoshi; Nishijima, Kazumi; Kato, Kazuo; Yamamoto, Ichiro; Mochida, Ei; and Ohtomo, Kikuo, 5,151,431, Cl. 514-292.000.

Nishijima, Kazunori, to NEC Corporation. Temperature compensated oscillation circuit. 5,151,667, Cl. 331-117.00R.

Nishikawa, Masao: *See*—
Yoshino, Ryutaro; Gomi, Hiroshi; Nishikawa, Masao; and Hirose, Masato, 5,151,859, Cl. 364-424.020.

Nishimaki, Tetsuo: *See*—
Tokairin, Shigeru; and Nishimaki, Tetsuo, 5,151,291, Cl. 426-581.000.

Nishimura, Genshiro: *See*—
Aoki, Hiroyuki; Suzuki, Tadashi; Katahata, Toshio; Haino, Mutsuo; Nishimura, Genshiro; Kaya, Hiroshi; Tamura, Kozaburo; and Isoda, Takeshi, 5,151,390, Cl. 501-95.000.

Nishimura, Hiroyuki: *See*—
Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, 5,150,922, Cl. 285-21.000.

Nishimura, Sadao: *See*—
Sekiya, Teruo; Kimura, Tomoaki; and Nishimura, Sadao, 5,150,597, Cl. 72-229.000.

Nishimura, Yasuo: *See*—
Ebara, Ryuichiro; Nakamoto, Hideo; Ukawa, Naohiko; Yamada, Tamotsu; and Nishimura, Yasuo, 5,151,248, Cl. 420-35.000.

Nishimura, Yutaka, to Hitachi, Ltd. Internal combustion engine control method and apparatus. 5,150,680, Cl. 123-399.000.

Nishino, Toshikazu: *See*—
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,151,409, Cl. 505-1.000.

Nishiuchi, Kihachiro: *See*—
Yuki, Syoji; Tokui, Yasuyuki; Nishiuchi, Kihachiro; Wada, Kenichi; Suzue, Masayoshi; and Morimoto, Takuo, 5,150,905, Cl. 273-218.000.

Nishiwaki, Hiroshi, to Techno Roll Co. Ltd.; and Jomac, Inc. Roll cover for dampening apparatus. 5,150,738, Cl. 139-420.00R.

Nishiyama, Toshikazu: *See*—
Yoshizawa, Yoshihito; Bizen, Yoshio; Yamauchi, Kiyotaka; Nishiyama, Toshikazu; and Suwabe, Shigekazu, 5,151,137, Cl. 148-313.000.

Nishiyama, Yoshinori; Yanagita, Tomoatsu; Nagai, Masahiko; Morikuni, Mitsuru; and Matsumoto, Kenji, to Hitachi, Ltd.; and Hitachi Computer Engineering Co., Ltd. Signal line terminal allocation method. 5,151,868, Cl. 364-490.000.

Nishiyama, Yukio; and Shigeta, Kazuo, to Nitto Denko Corporation. Adhesive sheet for reinforcing thin rigid plates. 5,151,327, Cl. 428-343.000.

Nishizawa, Taiji: *See*—
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

Nissan Chemical Industries, Ltd.: *See*—
Kitahara, Motohide; Ozaki, Hiroshi; and Shishido, Kouji, 5,151,108, Cl. 51-296.000.

Nissan Motor Co., Ltd.: *See*—
Aoyama, Shunichi, 5,150,677, Cl. 123-302.000.
Eguchi, Takaaki; and Sakita, Yuzo, 5,150,764, Cl. 180-141.000.
Hannya, Shuichi; and Iida, Nozomi, 5,150,542, Cl. 49-441.000.
Imajo, Minoru, 5,150,691, Cl. 123-531.000.
Ishikawa, Masahiro, 5,151,612, Cl. 307-234.000.
Kawabata, Kazunobu, 5,150,917, Cl. 280-707.000.
Matsuno, Yoshio; Choji, Shinichiro; Ito, Kazuhiko; and Shigeta, Teruaki, 5,151,850, Cl. 362-75.000.
Nakayama, Okihiko; Tsuda, Hiroshi; Mizushima, Katsuhiko; Itoh, Toshiyuki; and Ueno, Hiroshi, 5,151,862, Cl. 364-454.000.
Shimanaka, Shigeki; and Kato, Yuji, 5,150,761, Cl. 180-197.000.
Tahara, Hideo; and Makihara, Nobuo, 5,151,058, Cl. 440-61.000.
Wakahara, Tatsuo, 5,150,634, Cl. 74-866.000.
Yano, Hirofumi; and Yokoi, Seiji, 5,150,689, Cl. 123-519.000.

Nisshin Flour Milling Co., Ltd.: *See*—
Ozawa, Ryutaro; Hayakawa, Tomoya; Kato, Noriko; Kobayashi, Soichi; and Fuse, Seisaku, 5,151,289, Cl. 426-557.000.
Tokairin, Shigeru; and Nishimaki, Tetsuo, 5,151,291, Cl. 426-581.000.

Nitrojection Corporation: *See*—
Baxi, Indra R.; and Johnson, Tom W., 5,151,278, Cl. 425-130.000.

Nitsuko Corporation: *See*—
Abe, Kazuyuki, 5,151,933, Cl. 379-159.000.

Nittetsu Plant Designing Corp.: *See*—
Uchida, Takayuki; Ide, Satoshi; Yamamoto, Masahiro; and Yumoto, Atsushi, 5,150,598, Cl. 72-325.000.

Nitti Electric Industrial Co., Ltd.: *See*—
Otsuka, Saburo; Ito, Yuusuke; Yoshikawa, Toshiyuki; and Tokuda, Shoichi, 5,151,271, Cl. 424-443.000.

Nitto Boseki Co., Ltd.: *See*—
Kuroiwa, Katsumasa; Katayama, Katsuhiro; Miura, Toshihide; and Nagasawa, Takeshi, 5,151,372, Cl. 436-164.000.

Nitto Denko Corporation: *See*—
Nishiyama, Yukio; and Shigeta, Kazuo, 5,151,327, Cl. 428-343.000.
Yanagisawa, Shuichi; Sakai, Tatsuro; Murata, Yasushi; Matsui, Fumio; and Mitoh, Yasuo, 5,151,310, Cl. 428-64.000.

Nitz, Larry T.: *See*—
Gray, Charles A.; Milunas, Rimas S.; and Nitz, Larry T., 5,151,855, Cl. 395-750.000.
Milunas, Rimas S.; and Nitz, Larry T., 5,151,858, Cl. 364-424.100.

NKK Corporation: *See*—
Hagio, Akira; Ono, Yoshimi; and Honma, Hiroshi, 5,150,931, Cl. 285-381.000.

Noda, Hideo, to Shimano Industrial Co., Ltd. Two-bearing reel provided with engaging members for suspender strap. 5,150,854, Cl. 242-310.000.

Nohmi Bosai Co., Ltd.: *See—*
Takahashi, Kaoru; Tsumuji, Akio; and Shutoku, Ryuji, 5,151,683, Cl. 340-518.000.
Nokia Mobile Phones Ltd.: *See—*
Vaisanen, Risto; Sarasmo, Jukka; and Pekkarinen, Vesa, 5,152,004, Cl. 455-68.000.
Noll, Klaus; Pedain, Josef; Zorn, Bruno; and Schmid, Rosemarie, to Bayer Aktiengesellschaft. Process for the production of patent leather and patent leather prepared therefrom. 5,151,329, Cl. 428-423.400.
Norbeck, Daniel W.: *See—*
Sham, Hing L.; Norbeck, Daniel W.; Kempf, Dale J.; and Zhao, Chen, 5,151,438, Cl. 514-357.000.
Norcini, Gabriele: *See—*
Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, 5,151,414, Cl. 514-114.000.
Norden, Howard P., Jr. Norden double door lock. 5,150,591, Cl. 70-129.000.
Nordica S.p.A.: *See—*
Gorza, Roberto, 5,150,914, Cl. 280-616.000.
Tacchetto, Maurizio; Zorzi, Claudio; De Bortoli, Giuseppe; Pozzobon, Alessandro; and Serafin, Renato, 5,150,537, Cl. 36-50.500.
Nordischer Maschinenbau Rud. Baader GmbH & Co. KG: *See—*
Pontow, Hugo, 5,151,062, Cl. 452-179.000.
Nore, Pentti T.: *See—*
Backstrom, Reijo J.; Heinola, Kalevi E.; Nore, Pentti T.; Pystynen, Jarmo J.; Honkanen, Erkki J.; and Haikala, Heimo O., 5,151,420, Cl. 514-247.000.
Norizuki, Takayuki: *See—*
Suzuki, Akira; Norizuki, Takayuki; and Yamanashi, Yasuhiro, 5,151,403, Cl. 503-200.000.
Normalair-Garrett (Holdings) Limited: *See—*
Harral, Michael W.; and Rendell, Eric L., 5,151,166, Cl. 204-425.000.
Norman, Peter G. Resistance training device. 5,151,070, Cl. 482-99.000.
Norota, Kazuhiko: *See—*
Okawa, Koji; and Norota, Kazuhiko, 5,150,686, Cl. 123-698.000.
Norsk Hydro A.S.: *See—*
Strand, Olaf, 5,151,076, Cl. 493-186.000.
North American Philips Corp.: *See—*
Wong, Stephen L., 5,151,767, Cl. 357-43.000.
Northern Telecom Limited: *See—*
Hvezda, Jaroslav M.; Fisher, Robert W.; Olszewski, Edward J.; Morrin, Hugh F. C.; and Glover, Richard J., 5,151,961, Cl. 385-60.000.
Northland Aluminum Products, Inc.: *See—*
Bach, Ulf-Eiel F.; Rueter, Rodney N.; and Taylor, John N., 5,151,179, Cl. 210-250.000.
Northwestern University: *See—*
Horn, Alan S., deceased; and Dubocovich, Margarita L., 5,151,446, Cl. 514-617.000.
Norton Company: *See—*
Cho, Hyun S.; Sung, Chien-Min; Merrill, Leo; and Chen, Sy-Hwa, 5,151,107, Cl. 51-295.000.
Norton, Ian T.; and Underdown, Jeffrey, to Van den Bergh Foods Co., Division of Conopco, Inc. Water-in-oil dispersion and process for preparing such dispersion. 5,151,290, Cl. 426-576.000.
Nosaki, Takefumi; and Sasama, Kazuo, to Kabushiki Kaisha Toshiba. Image forming apparatus with improved image forming speed. 5,151,797, Cl. 358-474.000.
Nothdurft, Heinz; Trunk, Reinhard; Sprenger, Kurt; and Alvarez-Avila, Carlos, to Robert Bosch GmbH. Magnet valve, in particular for fuel injection pumps. 5,150,688, Cl. 123-506.000.
Noto, Kazuyuki; and Toyoshima, Isao, to Murata Manufacturing Co. Trap circuit comprising plural piezoelectric resonators interconnected by plural resistors and an inductor. 5,151,672, Cl. 333-189.000.
Notter, Frank: *See—*
Kaiser, Lutz; Kimmerle, Eugen; Mirbach, Erich; and Notter, Frank, 5,151,041, Cl. 439-157.000.
Nourrcier, Charles E., to Hughes Aircraft Company. Laser radar wire detection. 5,151,747, Cl. 356-5.000.
Novapure Corporation: *See—*
Tom, Glenn M., 5,151,395, Cl. 502-67.000.
NTN Corporation: *See—*
Tamada, Kenji; Nakajima, Hirokazu; Okayama, Akio; and Mizutani, Takahiro, 5,150,974, Cl. 384-463.000.
Nunley, Dwight S. Methods and apparatus for drilling subterranean wells. 5,150,757, Cl. 175-323.000.
Nusair, Marwan E.: *See—*
Valentine, Michael D.; Groth, Clarence R.; Scholl, Stephen R.; and Nusair, Marwan E., 5,151,701, Cl. 342-20.000.
O.K.-Kasei Co., Ltd.: *See—*
Hanatani, Tadashi; Sanzen, Satoru; and Deguchi, Jichio, 5,151,324, Cl. 428-323.000.
Oatley, John A.: *See—*
Kruger, Leon J.; and Oatley, John A., 5,151,301, Cl. 427-294.000.
Oba, Toshio: *See—*
Terashi, Kozo; and Oba, Toshio, 5,151,931, Cl. 378-65.000.
Obata, Masahiko: *See—*
Suzuki, Hideo; Matsushima, Shunichi; Masubuchi, Takamichi; Obata, Masahiko; and Sakama, Masao, 5,151,553, Cl. 84-600.000.
O'Brien, Mark: *See—*
Giordano, Edward C.; O'Brien, Mark; Petrucci, Raymond M.; and Taylor, Bruce G., 5,151,180, Cl. 210-264.000.
OCG Microelectronic Materials, Inc.: *See—*
Salamy, Thomas E.; Love, Marvin L., Jr.; and Towner, Mark E., 5,151,219, Cl. 252-364.000.
Sarubbi, Thomas R., 5,151,339, Cl. 430-192.000.
Tadros, Sobhy, 5,151,340, Cl. 430-192.000.
Ochi, Mitsuzo: *See—*
Araki, Yozo; Ito, Isamu; Sugimura, Tohru; Suzuki, Migaku; and Ochi, Mitsuzo, 5,150,562, Cl. 53-438.000.
Oda, Goichi; Toda, Atsushi; Yagi, Soichi; and Shibata, Hiroki, to Koito Manufacturing Co., Ltd. Lighting circuit for vehicular discharge lamp. 5,151,631, Cl. 315-127.000.
Oda, Tetsuya: *See—*
Matsumura, Kimiharu; Sakai, Hiroyuki; Murakami, Masaaki; Oda, Tetsuya; and Yamaguchi, Chizo, 5,151,871, Cl. 364-557.000.
Oda, Tomio: *See—*
Ueno, Ryuzo; Ueno, Ryuji; and Oda, Tomio, 5,151,444, Cl. 514-530.000.
Odawara, Yoji: *See—*
Kawaguchi, Hideo; Takeuchi, Kouji; Ishibashi, Tadashi; Shimizu, Norio; and Odawara, Yoji, 5,151,362, Cl. 435-240.250.
Odo, Koichi: *See—*
Kuzuhara, Syoji; Odo, Koichi; and Mizuno, Kyosuke, 5,151,023, Cl. 424-89.000.
Oellerer, Friedrich: *See—*
Theurer, Josef; and Oellerer, Friedrich, 5,151,002, Cl. 414-339.000.
Oerlikon-Contraves AG: *See—*
Gernet, Pierre; Steinemann, Werner; and Margot, Paul-Andre, 5,151,677, Cl. 338-99.000.
O'Farrell, Desmond J., to Donnelly Corporation. Vehicular outside mirror assembly. 5,151,824, Cl. 359-604.000.
Ogawa, Tsukasa: *See—*
Okada, Kenji; and Ogawa, Tsukasa, 5,150,648, Cl. 101-93.140.
Ogawara, Kensuke: *See—*
Inoue, Hiroshi; Kato, Toshikazu; and Ogawara, Kensuke, 5,151,495, Cl. 528-388.000.
Oh, Wook H.: *See—*
Yoo, Taek J.; Jang, Yong N.; Oh, Wook H.; and Jeong, Chan S., 5,151,186, Cl. 210-541.000.
O'Hara, Bryan M., to American Cyanamid Company. Host cells expressing gibbon ape leukemia virus receptor. 5,151,361, Cl. 435-240.200.
O'Hara, Kevin S.: *See—*
Austin, Curtiss M.; Darolia, Ramgopal; O'Hara, Kevin S.; and Ross, Earl W., 5,151,249, Cl. 420-445.000.
Ohashi, Tsuyoshi: *See—*
Sato, Shougo; Ohashi, Tsuyoshi; and Hirahata, Shinichi, 5,151,586, Cl. 250-205.000.
Ohio State University, The: *See—*
Zarabadi, Seyed R.; El-Naggar, Mohammed I.; and Khachab, Nabil I., 5,151,625, Cl. 307-529.000.
Ohkawa, Haruo: *See—*
Seki, Yukuharu; Sasashige, Hiroaki; and Ohkawa, Haruo, 5,150,514, Cl. 29-824.000.
Ohkoda, Keiji: *See—*
Kawasaki, Keiichi; Ohkoda, Keiji; Kudo, Tomohiro; and Shimizu, Satoshi, 5,151,713, Cl. 346-108.000.
Ohmine, Toshimitsu; Akagawa, Keiichi; and Ishihata, Akira, to Kabushiki Kaisha Toshiba. Vapor deposition apparatus. 5,151,133, Cl. 118-725.000.
Ohmura, Takao: *See—*
Kameyama, Shoju; Miyano, Kenmi; Hashimoto, Motonori; Takechi, Kazuo; Ohmura, Takao; Hirao, Yutaka; Uemura, Yahiro; and Yokoyama, Kazumasa, 5,151,499, Cl. 530-381.000.
Ohnaka, Hidemi; Tanaka, Masaaki; Kato, Yuuichi; Furuhashi, Michio; Satoya, Koichi; and Ooi, Yasuhiro, to Toyota Jidosha Kabushiki Kaisha. Boost pressure control system for a supercharged engine. 5,150,693, Cl. 123-559.300.
Ohnishi, Hiroyuki: *See—*
Wakita, Naohide; Iwai, Yoshio; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Johten, Kazuhiro; Kimura, Satoshi; and Fujiwara, Shozo, 5,151,803, Cl. 359-56.000.
Ohshima, Kinya: *See—*
Hiroi, Atsushi; Kondo, Mitsuhiro; and Ohshima, Kinya, 5,151,771, Cl. 357-70.000.
Ohta, Hiroshi; and Nakamura, Noriyuki, to Kabushiki Kaisha Shinkosha. Optical isolator. 5,151,955, Cl. 385-6.000.
Ohta, Minoru: *See—*
Tanaka, Kuniyoshi; Shirouzu, Shunji; Ohta, Minoru; and Miyagawa, Hideo, 5,151,659, Cl. 324-458.000.
Ohta, Takeo: *See—*
Kawahara, Katsumi; Uchida, Masami; Yoshioka, Kazumi; Ohta, Takeo; and Horai, Keiichiro, 5,151,295, Cl. 427-12.000.
Ohta, Yasuji: *See—*
Tanaka, Yoshinori; Taniguchi, Tomohiko; Amano, Fumio; Ohta, Yasuji; and Unagami, Sigeyuki, 5,151,968, Cl. 395-2.000.
Ohtomo, Kikuo: *See—*
Inaba, Hitoshi; Nishijima, Kazumi; Kato, Kazuo; Yamamoto, Ichiro; Mochida, Ei; and Ohtomo, Kikuo, 5,151,431, Cl. 514-292.000.
Ohya, Hiroshi; and Kato, Takeshi, to Hitach Metals, Ltd. Plastic pipe joint assembly for joining sections of plastic pipe. 5,150,923, Cl. 285-21.000.
Ohyama, Yoshishige: *See—*
Minowa, Toshimichi; and Ohyama, Yoshishige, 5,150,635, Cl. 74-866.000.

Ohzeki, Yukihiro; Araya, Junji; Ishiyama, Tatsunori; Sato, Yasushi; and Nakahata, Kimio, to Canon Kabushiki Kaisha. Image forming apparatus with controlled transfer voltage. 5,151,736, Cl. 355-208.000.

Oil-Dri Corporation of America: *See*—
Brooke, David D.; Brophy, Shirley A.; and Goss, George R., 5,151,211, Cl. 252-186.100.

Oka, Tateki: *See*—
Takemoto, Shinichi; Hasegawa, Hirofumi; Toyoshi, Naoki; Oka, Tateki; Goto, Hiroshi; and Yoshida, Narutaka, 5,151,738, Cl. 355-245.000.

Okada, Kenji; and Ogawa, Tsukasa, to Hitachi Koki Co., Ltd. Method and apparatus for detecting print-termination in line printer. 5,150,648, Cl. 101-93.140.

Okada, Tetsuya, to Furukawa Electric Co., Ltd., The. Rotary connector. 5,151,042, Cl. 439-169.000.

Okada, Yoshinori: *See*—
Mita, Seiichi; Izumita, Morishi; Ide, Hiroshi; Doi, Nobukazu; Okada, Yoshinori; and Inagaki, Yasuo, 5,151,924, Cl. 375-12.000.

Okahara, Shoji: *See*—
Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000.

Okamoto, Shoji: *See*—
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.

Okamura, Hideo: *See*—
Yamasaki, Yukihiro; Suetsugu, Toshio; Matsuo, Tamotsu; and Okamura, Hideo, 5,151,893, Cl. 369-116.000.

Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, to Daikin Industries, Ltd. Acicular iron carbide particulate material and process for producing same. 5,151,206, Cl. 252-62.510.

Okawa, Koji; and Norota, Kazuhiko, to Toyota Jidosha Kabushiki Kaisha. Evaporative fuel control apparatus of internal combustion engine. 5,150,686, Cl. 123-698.000.

Okayama, Akio: *See*—
Tamada, Kenji; Nakajima, Hirokazu; Okayama, Akio; and Mizutani, Takahiro, 5,150,974, Cl. 384-463.000.

Okayasu, Masami: *See*—
Tatara, Shinji; and Okayasu, Masami, 5,151,853, Cl. 363-160.000.

Okazaki, Kiyoshi, to Kabushiki Kaisha Toshiba. Method and system for controlling shock wave irradiation in a shock wave therapy apparatus. 5,150,713, Cl. 128-660.030.

Okazaki, Makoto; and Eto, Koji, to Fujitsu Limited. Method and apparatus for extracting isolated speech word. 5,151,940, Cl. 381-43.000.

Okazaki, Masaki: *See*—
Hoshiba, Akihiro; Okazaki, Masaki; and Hasegawa, Junichi, 5,150,673, Cl. 123-179.150.
Terai, Fumitaka; Yamagami, Hiroyuki; Uchino, Nobuhiko; and Okazaki, Masaki, 5,151,346, Cl. 430-546.000.

Okazaki, Susumu; and Kurosaki, Akito, to Dupont-Mitsui Fluorochemicals Co., Ltd. Process for the catalyic decomposition of chlorofluoroalkanes. 5,151,263, Cl. 423-659.000.

Okazaki, Yoji: *See*—
Okino, Yoshiharu; and Okazaki, Yoji, 5,151,714, Cl. 346-108.000.

Okazawa, Kazuhiko: *See*—
Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori; and Ito, Toshiyuki, 5,151,910, Cl. 372-31.000.

O'Keefe, Sheila: *See*—
Mydill, Marc R.; and O'Keefe, Sheila, 5,151,903, Cl. 371-27.000.

Oki Electric Industry Co., Ltd.: *See*—
Arizumi, Masato; Ozawa, Norio; Haruta, Yasuo; and Mabuchi, Yoshinobu, 5,151,932, Cl. 379-106.000.
Aso, Tsuyoshi, 5,151,768, Cl. 357-51.000.
Egawa, Noboru, 5,151,615, Cl. 307-443.000.

Okino, Yoshiharu; and Okazaki, Yoji, to Fuji Photo Film Co., Ltd. Color image recording apparatus. 5,151,714, Cl. 346-108.000.

Okubo, Hiroyuki, to Sony Magnescale Inc. Hologram scale. 5,151,798, Cl. 359-1.000.

Okuda, Haruo: *See*—
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

Okura, Kengo: *See*—
Sawada, Kazuo; Okura, Kengo; Yoshida, Noriyuki; Takano, Satoshi; Miyazaki, Kenji; and Hayashi, Noriki, 5,151,406, Cl. 505-1.000.

Oleson, Richard A., to E. D. Bullard Company. Protective helmet. 5,150,479, Cl. 2-414.000.

Olson, Wayne L.; and Choate, Gary E., to Rose Manufacturing Company. Load limiting apparatus for a hoist. 5,150,768, Cl. 182-234.000.

Olszewski, Edward J.: *See*—
Hvezda, Jaroslav M.; Fisher, Robert W.; Olszewski, Edward J.; Morrin, Hugh F. C.; and Glover, Richard J., 5,151,961, Cl. 385-60.000.

Olympus Optical Co., Ltd.: *See*—
Miyanaga, Hirofumi; Sakamoto, Nobuyuki; Yoshimitsu, Koichi; and Tanaka, Yasundo, 5,150,702, Cl. 128-6.000.
Miyazaki, Yasuhiro, 5,151,887, Cl. 369-44.320.
Sakurai, Tomohisa; and Gotanda, Masakazu, 5,151,085, Cl. 604-22.000.

O'Meara, Thomas R.: *See*—
Grinberg, Jan; O'Meara, Thomas R.; Owechko, Yuri; Pedinoff, Melvin E.; and Soffer, Bernard H., 5,151,814, Cl. 359-209.000.

Ominsky, Mark: *See*—
Lyke, David G.; and Ominsky, Mark, 5,151,948, Cl. 382-7.000.

Omron Tateisi Electronics Co.: *See*—
Hirahara, Kazuaki, 5,151,692, Cl. 340-825.280.

1-800 Geopoly: *See*—
Desmarais, Daniel; and Wallace, Jack R., 5,150,907, Cl. 273-240.000.

Ono, Yoshimi: *See*—
Hagio, Akira; Ono, Yoshimi; and Honma, Hiroshi, 5,150,931, Cl. 285-381.000.

Onoe, Seizo; and Umeda, Narumi, to Nippon Telegraph and Telephone Corporation. Wireless signal transmission system with random access. 5,151,693, Cl. 340-825.300.

Onzo, Joseph J. Heptahedron random character selector. 5,150,900, Cl. 273-146.000.

Ooi, Yasuhiro: *See*—
Ohnaka, Hidemi; Tanaka, Masaaki; Kato, Yuuichi; Furuhashi, Michio; Satoya, Koichi; and Ooi, Yasuhiro, 5,150,693, Cl. 123-559.300.

Oono, Masahiro; and Chiba, Tohru, to Asahi Kogaku Kogyo K.K. Method of measuring refractive indices of lens and sample liquid. 5,151,752, Cl. 356-128.000.

Oostenbrink, Albertus A.: *See*—
Lodder, Bernhard; van Dijk, Berend J.; Paulen, Adriaan; and Oostenbrink, Albertus A., 5,150,928, Cl. 285-205.000.

Oota, Hisasi; and Moritsu, Kazuki, to Mitsubishi Denki K.K. Cryostat. 5,150,578, Cl. 62-47.100.

Oota, Nobuyuki: *See*—
Akagi, Motonobu; Oota, Nobuyuki; and Yamada, Yasutoshi, 5,150,697, Cl. 123-643.000.

Oppenheim, Amos B.: *See*—
Levanon, Avigdor; Oppenheim, Amos B.; and Locker-Giladi, Hilla, 5,151,364, Cl. 435-252.330.

Orbital Engine Company Proprietary Limited: *See*—
McKay, Michael L.; Thompson, Ian R.; and Sarich, Ralph T., 5,150,836, Cl. 239-5.000.

Orimoto, Masaaki: *See*—
Takatori, Naoki; and Orimoto, Masaaki, 5,151,790, Cl. 358-225.000.

Orion Corporation/Orion Pharmaceutica: *See*—
Backstrom, Reijo J.; Heinola, Kalevi E.; Nore, Pentti T.; Pystynen, Jarmo J.; Honkanen, Erkki J.; and Haikala, Heimo O., 5,151,420, Cl. 514-247.000.

Orion Industries, Inc.: *See*—
Leslie, Samuel A.; and Gordon, Robert T., 5,152,002, Cl. 455-11.100.

Orndorff, Joseph D.: *See*—
Krzywicki, Stanley J.; Gibson, Timothy S.; and Orndorff, Joseph D., 5,151,654, Cl. 324-160.000.

Ortech Corporation: *See*—
Carter, Stephen A.; Williamson, Bryan C.; and Kozole, Karl H., 5,150,690, Cl. 123-527.000.

Ortiz, Mark V.: *See*—
Davenport, Scott A.; Ortiz, Mark V.; Chen, Linda; and Kuizenga, Dirk J., 5,151,909, Cl. 372-22.000.

Osaka Gas Company, Ltd.: *See*—
Madou, Marc J.; Narang, Subhash C.; Otagawa, Takaaki; and Wing, Sharon, 5,151,224, Cl. 252-586.000.
Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, 5,150,922, Cl. 285-21.000.

Osato, Kazumi: *See*—
Muramatsu, Shigeki; Takasugi, Shinji; and Osato, Kazumi, 5,151,658, Cl. 324-346.000.

Osawa, Masahiko, to Sumitomo Electric Industries, Ltd. Light emitting diode for photosensor and photosensor with such a diode. 5,151,628, Cl. 313-499.000.

O'Shea, Donald C.: *See*—
Massof, Robert W.; O'Shea, Donald C.; and Raasch, Thomas W., 5,151,722, Cl. 351-158.000.

Oshima, Takeshi: *See*—
Sato, Aiya; Sugano, Michihiro; Furuya, Kouhei; Oshima, Takeshi; Kuwano, Harumitsu; Hata, Tadashi; and Haruyama, Hideyuki, 5,151,529, Cl. 549-354.000.

Osterholm, Jan-Erik; Laakso, Jukka; Karjalainen, Sari; and Mononen, Pirjo, to Berggren Oy Ab. Conductive plastic composites. 5,151,221, Cl. 252-500.000.

Ota, Hiroyuki, to Pioneer Electronic Corporation. Current transmitting mechanism in magnetic recording and reproducing apparatus. 5,151,839, Cl. 360-108.000.

Ota, Kazuya: *See*—
Magome, Nobutaka; Ota, Kazuya; Mizutani, Hideo; and Komatsu, Kouichiro, 5,151,750, Cl. 356-401.000.

Otagawa, Takaaki: *See*—
Madou, Marc J.; Narang, Subhash C.; Otagawa, Takaaki; and Wing, Sharon, 5,151,224, Cl. 252-586.000.

Otaki, Keizaburo: *See*—
Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000.

Otsuka Chemical Company, Limited: *See—*
Yuki, Syoji; Tokui, Yasuyuki; Nishiuchi, Kihachiro; Wada, Kenichi; Suzue, Masayoshi; and Morimoto, Takuo, 5,150,905, Cl. 273-218.000.

Otsuka, Ichiro: *See—*
Ishida, Yuzuru; Inoue, Haruo; Otsuka, Ichiro; Takaku, Masato; Mitsuboshi, Masahiro; Iio, Keiji; and Hashimoto, Atsushi, 5,151,457, Cl. 524-157.000.

Otsuka Kagaku Kabushiki Kaisha: *See—*
Imai, Tetuya, 5,151,524, Cl. 548-307.000.

Otsuka, Saburo; Ito, Yuusuke; Yoshikawa, Toshiyuki; and Tokuda, Shoichi, to Nitti Electric Industrial Co., Ltd. Pressure-sensitively adhering composite medicinal preparation. 5,151,271, Cl. 424-443.000.

Outboard Marine Corporation: *See—*
Higby, Jeffrey P., 5,151,059, Cl. 440-75.000.

Outokumpu Oy: *See—*
Marttila, Tom E.; Kivisto, Tuomo V. J.; and Ahola, Pentti V., 5,151,006, Cl. 414-626.000.

Owechko, Yuri: *See—*
Grinberg, Jan; O'Meara, Thomas R.; Owechko, Yuri; Pedinoff, Melvin E.; and Soffer, Bernard H., 5,151,814, Cl. 359-209.000.

Owen, Hartley: *See—*
Harandi, Mohsen N.; and Owen, Hartley, 5,151,393, Cl. 502-53.000.

Owen, Stephen J.: *See—*
Moffitt, Robert C.; and Owen, Stephen J., 5,150,857, Cl. 244-12.200.

Oxenrider, Bryce C.; Long, David J.; and Mares, Frank, to Allied-Signal Inc. Copolymerization of vinyl acetate and a fluoromonomer in an aqueous medium. 5,151,477, Cl. 526-216.000.

Oy Nokia AB: *See—*
Honkanen, Seppo, 5,151,958, Cl. 385-50.000.

Ozaki, Hiroshi: *See—*
Kitahara, Motohide; Ozaki, Hiroshi; and Shishido, Kouji, 5,151,108, Cl. 51-296.000.

Ozawa, Norio: *See—*
Arizumi, Masato; Ozawa, Norio; Haruta, Yasuo; and Mabuchi, Yoshinobu, 5,151,932, Cl. 379-106.000.

Ozawa, Ryutaro; Hayakawa, Tomoya; Kato, Noriko; Kobayashi, Soichi; and Fuse, Seisaku, to Nisshin Flour Milling Co., Ltd.; and MA MA-Macaroni Co., Ltd. Process of preparing frozen instant cooking noodles. 5,151,289, Cl. 426-557.000.

P. L. Porter Company: *See—*
Porter, Clyde R., 5,150,771, Cl. 188-67.000.

Pacropis, Donald R.: *See—*
Ibsen, Robert L.; Pacropis, Donald R.; and Glace, William R., 5,151,453, Cl. 522-14.000.

Paffrath, Edgar C.; and Hanson, Brian A., to Wesbar Corporation. Combination side marker, clearance and reflex lamp for a vehicle. 5,150,959, Cl. 362-80.000.

Paganon, Henri; and Pichon, Guy, to Robert Bosch GmbH. Supply circuit for operation of an electromagnetic load. 5,150,687, Cl. 123-490.000.

Pahoundis, Louis E.: *See—*
Stoner, David J.; Sanger, Joseph M.; Pahoundis, Louis E.; and Riahi, James H., 5,150,991, Cl. 406-67.000.

Pakulski, Francis J.: *See—*
Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., 5,151,559, Cl. 174-52.400.

Palanisamy, Ponnusamy: *See—*
Akin, Timur; Myers, Bruce A.; Maki, William M.; and Palanisamy, Ponnusamy, 5,151,777, Cl. 357-81.000.

Palfreyman, Malcolm N.: *See—*
Cook, David C.; Hart, Terance W.; Mc Lay, Iain M.; Palfreyman, Malcolm N.; Sharp, Brian W.; and Walsh, Roger J. A., 5,151,436, Cl. 514-314.000.

Palitex Project Company GmbH: *See—*
Stenmans, Heinz, 5,150,566, Cl. 57-58.830.

Pall Corporation: *See—*
Matkovich, Vlado I.; Degen, Peter J.; Gsell, Thomas C.; Bormann, Thomas; and Rothman, Isaac, 5,151,192, Cl. 210-646.000.

Pang, Hian S. Anti-liquid splash device. 5,150,481, Cl. 4-300.300.

Pantale, David; and Schonenberger, Eric, to General Motors France. Disc brake caliper with an integral proportioning valve. 5,150,772, Cl. 188-72.400.

Paoli, Michele E.: *See—*
Huijben, Gregorius J.; van Kralingen, Cornelis G.; Liem, Seeng D; and Paoli, Michele E., 5,151,208, Cl. 252-174.140.

Paoli, Thomas L., to Xerox Corporation. Array and method of operating a modulated solid state laser array with reduced thermal crosstalk. 5,151,915, Cl. 372-50.000.

Papenfuhs, Theodor: *See—*
Arndt, Otto; and Papenfuhs, Theodor, 5,151,532, Cl. 552-308.000.

Parente, Charles A.; and Westerback, Sonya J., to Grumman Aerospace Corporation. Acoustic attenuating liner and method of making same. 5,151,311, Cl. 428-116.000.

Park, Han K.: *See—*
Fishler, Mark K.; Rancoule, Gilbert; Park, Han K.; and Robinson, Quentin K., 5,151,201, Cl. 222-600.000.

Park, Young-Jun, to SamSung Electronics Co., Ltd. Method and circuit for correcting image edge. 5,151,787, Cl. 358-162.000.

Parker, Donald L., to General Motors Corporation. Hydraulic brake booster. 5,150,575, Cl. 60-547.100.

Paroubek, George: *See—*
Svyatsky, Eduard M.; Paroubek, George; and Hegland, Frederick P., 5,150,891, Cl. 271-35.000.

Parrish, Gary C.: *See—*
Lindsay, Robert B.; and Parrish, Gary C., 5,151,148, Cl. 156-351.000.

Pasco, Ian K., to Combined Optical Industries Limited. Fresnel lens. 5,151,826, Cl. 359-742.000.

Pasternak, Jeffrey, to Dynaflair Corporation Canada Inc. Hinge connecting post for folding closures. 5,150,501, Cl. 16-272.000.

Pastryk, Jim J.: *See—*
Singh, Devirder; Hardaway, Anthony H.; Euler, John W.; and Pastryk, Jim J., 5,150,588, Cl. 68-23.500.

Patchett, Arthur A.: *See—*
Bagley, Scott; Greenlee, William J.; Dhanoa, Daljit S.; and Patchett, Arthur A., 5,151,435, Cl. 514-303.000.

Patel, Chetan G.: *See—*
Seyfried, Joseph A.; and Patel, Chetan G., 5,150,807, Cl. 220-359.000.

Patel, Sanjay R.: *See—*
El-Hibri, Mohammad J.; Jack, Gregory S.; Kelly, William E.; and Patel, Sanjay R., 5,151,462, Cl. 524-405.000.

Paul, James M.; and Morris, Richard L., to Mobil Oil Corporation. Method for regenerating scale solvent. 5,151,196, Cl. 210-712.000.

Paulen, Adriaan: *See—*
Lodder, Bernhard; van Dijk, Berend J.; Paulen, Adriaan; and Oostenbrink, Albertus A., 5,150,928, Cl. 285-205.000.

Paulson, Eric W.: *See—*
Zschoche, Robert A., 5,151,003, Cl. 414-428.000.

Pavanasasivam, Gowsala: *See—*
Morgan, A. Charles, Jr.; and Pavanasasivam, Gowsala, 5,151,266, Cl. 424-85.800.

Payne, George K.: *See—*
Emerson, Terence P.; Bescoby, Frank A.; Taylor, Colin M.; and Payne, George K., 5,151,022, Cl. 423-245.300.

Payne, Harold E.: *See—*
Cassel, Terry E.; Payne, Harold E.; and Lynde, Gerald D., 5,150,755, Cl. 166-297.000.

Payne, Jewel M., to Mycogen Corporation. Isolates of *Bacillus thuringiensis* that are active against nematodes. 5,151,363, Cl. 435-252.500.

Payne, Robert J.; and Yoppolo, Robert A., to Duracell Inc. Crimping method for electrochemical cells. 5,150,602, Cl. 29-623.200.

Pazzaglia, Luigi, to Cefin S.p.A. Machine for beading cylindrical cans or can bodies. 5,150,594, Cl. 72-92.000.

PCI/Delvco, Inc.: *See—*
Tannenbaum, Michael A., 5,150,793, Cl. 206-531.000.

Pearson, Ronald W.; and Jones, Brian W., to Dallas Semiconductor Corporation. Battery manager chip with crystal-controlled time base. 5,151,644, Cl. 320-14.000.

Pedain, Josef: *See—*
Noll, Klaus; Pedain, Josef; Zorn, Bruno; and Schmid, Rosemarie, 5,151,329, Cl. 428-423.400.
Schmalstieg, Lutz; Hihlein, Peter; Pedain, Josef; and Wieczorrek, Wolfhart, 5,151,484, Cl. 528-45.000.

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Currie, James H.; Peden, Richard A.; Sczomak, David P.; Mitchell, Mark A.; and Brown, Michael J., 5,150,694, Cl. 123-569.000.

Pedinoff, Melvin E.: *See—*
Grinberg, Jan; O'Meara, Thomas R.; Owechko, Yuri; Pedinoff, Melvin E.; and Soffer, Bernard H., 5,151,814, Cl. 359-209.000.

Pekkarinen, Vesa: *See—*
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Pelikan Aktiengesellschaft: *See—*
Manusch, Cristoph; and Harp, Hans-Jurgen, 5,150,851, Cl. 242-68.100.

Pellegrino, Sergio: *See—*
Vidimari, Fabio; and Pellegrino, Sergio, 5,151,914, Cl. 372-46.000.

Pemsler, J. Paul; and Litchfield, John K., to United States of America, Navy. Pyrite cathode material for a thermal battery. 5,151,262, Cl. 423-561.100.

Penisson, Dennis J., to Bilco Tools, Inc. Power tong for making up or breaking out threaded joints of pipe. 5,150,638, Cl. 81-57.170.

Penninga, Johannes: *See—*
Van Nes, Johannes C. A.; and Penninga, Johannes, 5,151,627, Cl. 313-477.00R.

Penta-Ocean Construction Co., Ltd.: *See—*
Hayashi, Nobuharu; and Tanaka, Hiroji, 5,150,744, Cl. 114-230.000.

Percic, Adelio. Golfer's training device. 5,150,903, Cl. 273-188.00A.

Perenyi, Andras; Utpal, Goswami; Arato, Mihaly; Frescka, Ede; Knoll, Jozsef; and Bela, D. Arpad, to Chinoin Gyogyszer- es Vegyeszeti Termekek Gyara Rt. Composition for the treatment of schizophrenia. 5,151,419, Cl. 514-226.200.

Perilloux, Bruce; Bloom, Arnold; Fischer, Dennis; Giammona, Larry; and Johnston, Thomas F., to Coherent, Inc. Laser resonators employing diffractive optical elements. 5,151,917, Cl. 372-102.000.

Perren, Stephen: *See—*
Tepic, Slobodan; Perren, Stephen; Straumann, Fritz; and Sutter, Franz, 5,151,103, Cl. 606-69.000.

Perret, Michel, to GEC Alsthom SA. Medium tension circuit breaker. 5,151,565, Cl. 200-148.00A.

Perrington, Kenneth J.; and Emery, Clair J., to Minnesota Mining and Manufacturing Company. Edge padding adhesive composition for carbonless papers. 5,151,461, Cl. 524-387.000.

Perry, Mordechai; Yacubowicz, Henia; Linder, Charles; Nemas, Mara; and Katraro, Reuven, to Membrane Products Kiryat Weizmann Ltd. Polyphenylene oxide-derived membranes for separation in organic solvents. 5,151,182, Cl. 210-500.270.

Perry, Wayne E.: *See—*
Kirk, William D., III; DeCaro, Anthony A.; and Perry, Wayne E., 5,151,089, Cl. 604-192.000.

Perry, William D.: *See—*
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Pesapane, Joel J. Support member. 5,150,867, Cl. 248-213.200.

Pet Mate Limited: *See—*
Kirk, Christopher P., 5,150,664, Cl. 119-51.120.

Peter, Cornelius, to Robert Bosch GmbH. Electronic butterfly valve adjuster having continuous fault monitoring system. 5,150,679, Cl. 123-397.000.

Peters, Wilhelmus C. M.: *See—*
Josquin, Wilhelmus J. M. J.; Peters, Wilhelmus C. M.; and Van De Goor, Albertus T. M., 5,151,382, Cl. 437-74.000.

Petrofes, James M.; Shal, David A.; Denton, Gary R.; and Hoptry, David A., to General Motors Corporation. Motor vehicle suspension with damper having rotatable member overrun detection. 5,150,916, Cl. 280-707.000.

Petrofes, James M.: *See—*
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Petrolite Corporation: *See—*
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Petrucci, Raymond M.: *See—*
Giordano, Edward C.; O'Brien, Mark; Petrucci, Raymond M.; and Taylor, Bruce G., 5,151,180, Cl. 210-264.000.

Petsche, Thomas, to Siemens Corporate Research Inc. Self-repairing trellis networks. 5,151,969, Cl. 395-24.000.

Petty, John; and McNeil, Sandy, to Elconnex Pty Limited. Corrugated pipe connector and method of molding. 5,150,930, Cl. 285-319.000.

Petutschnig, Wolfgang: *See—*
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Peyrot, Marianne: *See—*
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Pfaffel, Bruno: *See—*
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Pfizer Hospital Products Group, Inc.: *See—*
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Pfizer Inc.: *See—*
McCarthy, Peter A.; and Walker, Frederick J., 5,151,545, Cl. 560-60.000.

Phadke, Shrikant V. Single step bulk process for high impact polyester masterbatches, products thereof and blends with polyesters. 5,151,466, Cl. 525-177.000.

Pham, Thuan N.: *See—*
Kelley, Richard L.; Pham, Thuan N.; and Kearns, Kevin J., 5,150,785, Cl. 206-217.000.

Phelps, Craig H.; and Strom, E. Thomas, to Mobil Oil Corporation. Aqueous and petroleum gel method for preventing water-influx. 5,150,754, Cl. 166-294.000.

Philip Morris Incorporated: *See—*
Adkins, Wayne B.; and Roncero, Jose I., 5,150,719, Cl. 131-96.000.
Sharpe, David E., 5,151,648, Cl. 323-282.000.

Phillips, Jerry G. Anisotropically bendable heating pad. 5,151,578, Cl. 219-549.000.

Phillips, Michael J., to AMP Incorporated. Connector for connecton to a celluar telephone. 5,151,047, Cl. 439-333.000.

Phillips Petroleum Company: *See—*
Fu, Chia-Min; Maholland, Michael K.; and Lowery, Richard E., 5,151,391, Cl. 502-27.000.
Kidd, Dennis R., 5,151,257, Cl. 423-230.000.
Lee, Fu-Ming; and Brown, Ronald E., 5,151,161, Cl. 203-51.000.
Mitchell, Kent E., 5,151,397, Cl. 502-107.000.
Reed, Jerry O., 5,151,235, Cl. 264-209.500.
Schubert, Paul F.; Kubicek, Donald H.; and Kidd, Dennis R., 5,151,401, Cl. 502-329.000.

Pichler, Robert H., to Fibra-Sonics, Inc. Apparatus for eliminating air bubbles in an ultrasonic surgical device. 5,151,083, Cl. 604-22.000.

Pichon, Guy: *See—*
Paganon, Henri; and Pichon, Guy, 5,150,687, Cl. 123-490.000.

Pickard, Gerald W. Servo valve. 5,150,876, Cl. 251-14.000.

Pickering, Michael: *See—*
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Pielartzik, Harald: *See—*
Heinz, Hans-Detlef; Pielartzik, Harald; Reinking, Klaus; Meyer, Rolf-Volker; and Korte, Siegfried, 5,151,458, Cl. 524-190.000.

Pierags, Hans-Joachim: *See—*
Arndt, Ulrich; Luneburg, Peter; Marquardt, Kurt; Pierags, Hans-Joachim; and Zeuschner, Ulrich, 5,151,280, Cl. 425-186.000.

Pierson, Bruce A., to Rotex, Inc. Retractable, air pressure actuated hold-down clamp. 5,150,796, Cl. 209-370.000.

Pike, Daniel E. Pressure generator/gas scrubber. 5,151,112, Cl. 55-230.000.

Pille, Geert M. E.: *See—*
Janssens, Frans E.; Diels, Gaston S. M.; and Pille, Geert M. E., 5,151,424, Cl. 514-258.000.

Pioneer Electronic Corporation: *See—*
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Ito, Hiroshi; Ando, Seigo; and Inaba, Bonpei, 5,151,793, Cl. 358-335.000.
Moriyama, Yoshiaki, 5,151,699, Cl. 341-58.000.
Moriyama, Yoshiaki; and Kobayashi, Satomi, 5,151,791, Cl. 358-261.200.
Ota, Hiroyuki, 5,151,839, Cl. 360-108.000.
Sasaki, Yoshio, 5,151,942, Cl. 381-94.000.
Suzuki, Kiyomi; and Chijiiwa, Masaru, 5,151,872, Cl. 364-571.050.
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Pirklbauer, Wilfried: *See—*
Auer, Johann; Pirklbauer, Wilfried; Ramaseder, Norbert; and Smejkal, Hellmuth, 5,151,243, Cl. 266-78.000.

Piro, Ronald A.: *See—*
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Piwinski, John J.; Green, Michael J.; and Wong, Jesse, to Schering Corporation. Heterocyclic n-oxide derivatives of substituted benzo[5,6]cycloheptapyridines, compositions and methods of use. 5,151,423, Cl. 514-254.000.

Planek, Werner: *See—*
Masur, Ernst; Ruoff, Gottfried; and Planek, Werner, 5,150,973, Cl. 384-448.000.

Plant Services Corp.: *See—*
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Poch, Neil, to Tour-Mate Systems Canada Limited. Record message delivery system. 5,152,003, Cl. 455-18.000.

Podszun, Wolfgang; Muller, Michael; Cramer, Wilfried; and Rehbold, Bodo, to Bayer Aktiengesellschaft. Process for the production of mouldings of crosslinked polymers. 5,151,480, Cl. 526-279.000.

Poisel, Hans: *See—*
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Polaroid Corporation: *See—*
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Poli, Nicola: *See—*
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Politiek, Jarig; and Ligthart, Henricus J., to U.S. Philips Corporation. Method of irradiating an object by means of a charged particle beam, and device for performing the method. 5,151,605, Cl. 250-492.200.

Ponnet, Tom P. M. G. Composite material for medical or paramedical particularly orthopaedic use and method for manufacturing it. 5,151,315, Cl. 428-212.000.

Pontow, Hugo, to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG. Apparatus for turning over fish fillets. 5,151,062, Cl. 452-179.000.

Poole, John S.: *See—*
Nickerson, Mark A.; Poole, John S.; and Frank, Lenore G. R., 5,151,178, Cl. 210-198.200.

Pophillat, Lucien, to French State Represented by the Minister of Post, Telecommunications and Space (Centre National d'Etudes des Telecommunications). Method for the coding of a digital signal, coder and decoder to implement this method, regeneration method and corresponding regenerator utilizing pulse position modulation. 5,151,698, Cl. 341-52.000.

Popiel, Czeslaw O.: *See—*
Turner, John T.; and Popiel, Czeslaw O., 5,150,619, Cl. 73-861.220.

Porter, Clyde R., to P. L. Porter Company. Coil spring or friction-lock mechanisms. 5,150,771, Cl. 188-67.000.

Porter, Fred C.; and Schultz, Garth J. Apparatus and method for converting conventionally fueled engines to operate on an alternative fuel. 5,150,685, Cl. 123-478.000.

Portevin, Bernard: *See—*
Vincent, Michel; Remond, Georges; Portevin, Bernard; Herve, Yolande; and Lepagnol, Jean, 5,151,432, Cl. 514-299.000.

Poskitt, Geoffrey, to International Computers Limited. Data processing system with information transfer bus and wait signal. 5,151,979, Cl. 395-325.000.

Poulin, Jean-Marc; and Schmidely, Herve , to Nestec S.A. Process and apparatus for controlling froth of an instant coffee beverage. 5,151,199, Cl. 210-773.000.

Pouysegur, Michel: *See—*
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Powell, Douglas B.: *See—*
Newman, William C.; Titchener, Paul F.; and Powell, Douglas B., 5,151,984, Cl. 395-500.000.

Powell, Paul E.; and Britton, Larry N. Combination vibrator, aerator, and liquid-injection system. 5,150,988, Cl. 405-258.000.

Powers, Kelly R.; Curtis, Tony G.; Limaye, Santosh Y.; and Roy, Robert D. Ceramic capacitance high pressure fluid sensor. 5,151,660, Cl. 324-689.000.

Powers, Michael D.: *See—*
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Pozzobon, Alessandro: *See—*
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PPG Industries, Inc.: *See—*
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Pratt, Charles F.: *See—*
Yates, John B., III; Pratt, Charles F.; and McHale, Angelika H., 5,151,460, Cl. 524-291.000.

Preik, Marc R. Truck mirror wiper. 5,150,497, Cl. 15-250.003.

Premier Medical Technology, Inc.: *See*—
Miller, Charles R.; Berry, Haskell B., Jr.; and Johnson, Tod S., 5,150,843, Cl. 241-27.000.
Press, Richard L.: *See*—
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Press Seal Gasket Corporation: *See*—
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Prevent-A-Crime International, Inc.: *See*—
Jack, David E., 5,151,572, Cl. 219-121.690.
Price, Anthony, to Imperial Chemical Industries PLC. Micro-emulsions. 5,151,217, Cl. 252-312.000.
Pritschins, Wolfgang: *See*—
Haubennestel, Karl-Heinz; and Pritschins, Wolfgang, 5,151,218, Cl. 252-351.000.
Priven, Michael P.: *See*—
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McCall, Patrick C.; and Cothran, Philip E., 5,151,209, Cl. 252-174.150.
Muckenfuhs, Delmar R., 5,150,561, Cl. 53-412.000.
Saltman, Paul D.; and Smith, Kenneth T., 5,151,274, Cl. 424-630.000.
Steuri, Christian; and Williams, Theresa B., 5,151,210, Cl. 252-174.017.
Provenzano, Virgil; Singh, Anand K.; Imam, M. A.; Sadananda, Kuntimadi; and Henshaw, William F., to United States of America, Navy. Method of producing Bi-Sr-Ca-Cu-O superconducting materials in cast form. 5,151,407, Cl. 505-1.000.
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Quebedeaux, Larry J.: *See*—
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Quimby, Bruce D.; and Sullivan, James J., to Hewlett-Packard Company. Method and scavenger gas for the analysis of oxygen-containing components using atomic emission spectrometry. 5,151,371, Cl. 436-127.000.
Quinlan, Roger J., Jr.; and Simpson, Stephen J., to Haworth, Inc. Panel-post arrangement. 5,150,554, Cl. 52-282.000.
Quinn, Jennifer J.: *See*—
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Qureshi, Shahid P.; and Gardner, Hugh C., to Amoco Corporation. Epoxy matrix resin formulations with improved storage stability containing powdered diamine dispersions. 5,151,471, Cl. 525-423.000.
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Ramde, Amolak R., to National Semiconductor Corporation. Self-aligned planar monolithic integrated circuit vertical transistor process. 5,151,378, Cl. 437-31.000.
Ranc, Roger; Brisset, Armand; and Debos, Marcel, to Lafarge Nouveaux Materiaux. Cement-base injection grout for consolidating structures. 5,151,126, Cl. 106-719.000.
Rancoule, Gilbert: *See*—
Fishler, Mark K.; Rancoule, Gilbert; Park, Han K.; and Robinson, Quentin K., 5,151,201, Cl. 222-600.000.
Range, Helmut; and Beigel, Gerhard, to Staff GmbH & Co. KG. Transparent contact rail. 5,151,037, Cl. 439-110.000.
Range, Helmut; Beigel, Gerhard; Lotsch, Friedemann; and Debie, Peter, to Staff GmbH & Co. KG. Adapter for contact rails. 5,151,038, Cl. 439-122.000.
Ranger All Season Corp.: *See*—
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Rasmusson, Gary H.; and Reynolds, Glenn F., to Merck & Co., Inc. 17β-acyl-4-aza-5α-androst-1-ene-3-ones as 5α reductase inhibitors. 5,151,429, Cl. 514-284.000.
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Steinberg, Nathan G.; Rasmusson, Gary H.; and Salzmann, Thomas N., 5,151,430, Cl. 514-284.000.
Rauschenberger, Michael. Toilet bowl illuminating device. 5,150,962, Cl. 362-101.000.
Rautenberg, Paul-Georg, to Stocko Metallwarenfabriken Henkels und Sohn GmbH & Co. Device for electrically contacting an electronic apparatus with an IC-memory card. 5,151,847, Cl. 361-395.000.
Rawson, Ken: *See*—
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Raychem Limited: *See*—
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Rebenack, Frances S. Travel case organizer. 5,150,776, Cl. 190-110.000.
Recot, Inc.: *See*—
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Redick, Morris R., to General Motors Corpor[illegible]. Rear license plate illumination. 5,150,960, Cl. 362-83.200.
Reed, Jerry O., to Phillips Petroleum Company. Process of making phenylene sulfide/biphenylene sulfide copolymer pipe. 5,151,235, Cl. 264-209.500.
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Stoner, David J.; Sanger, Joseph M.; Pahoundis, Louis E.; and Riahi, James H., 5,150,991, Cl. 406-67.000.
Reedy, David V., to General Electric Company. Nozzle load management. 5,150,839, Cl. 239-265.410.
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Reeves, William G.; Powers, Michael D.; Mathis, Michael P.; and Duello, Leonard E., to Kimberly-Clark Corporation. Method of making conductive, water and/or alcohol repellent nonwoven fabric and resulting product. 5,151,321, Cl. 428-286.000.
Regimand, Ali, to Troxler Electronic Laboratories, Inc. Nuclear gauge with compensation for sample of insufficient neutron moderating activity. 5,151,601, Cl. 250-390.040.
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Reiffenrath, Volker; and Finkenzeller, Ulrich, to Merck Patent Gesellschaft mit beschrankter Haftung. Fluorine-containing aromatic compounds. 5,151,213, Cl. 252-299.600.
Reinauer, Josef, to Gottlieb Guhring KG. Coupling for a detachable fixing of components at appropriate carrier members. 5,150,995, Cl. 409-234.000.
Reiner, Thomas C.; Lindsey, Mark J.; and Kelkar, Krishnanand, to Titan Corporation, The. Reconfigurable, multi-user Viterbi decoder. 5,151,904, Cl. 371-43.000.
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Lee, George C.; and Sun, Xianyi, 5,151,945, Cl. 382-1.000.
Rettenmaier, Helmut: *See*—
Busch, Peter; Rettenmaier, Helmut; and Sterzik, Willi, 5,151,851, Cl. 363-25.000.

Reveilleau, Pierre; Mahuzier, Georges; Chalom, Joseph; Farinotti, Robert; Tod, Michel; and Barre, Edith, to Laboratories Eurobio. Derivatives of tetrahydro-2,3,6,7,1H,5H,11H-(1)benzopyrano(6,7,-8,i,j)quinolizinone-11 usable as markers for organic compounds, particularly biological compounds with a view to their detection by chemiluminescence or fluorescence. 5,151,517, Cl. 546-66.000.

Revlon, Inc.: *See—*
Kamen, Melvin E.; and Bernstein, Philip, 5,150,791, Cl. 206-457.000.

Reynolds, Glenn F.: *See—*
Rasmusson, Gary H.; and Reynolds, Glenn F., 5,151,429, Cl. 514-284.000.

Reynolds Metals Company: *See—*
Foster, Walter W.; Boatwright, Gregory L.; and Lewis, Thomas E., 5,151,147, Cl. 156-244.120.

Reynolds, Steve N.: *See—*
Vaughn, Stephen N.; Siskin, Michael; Katritzky, Alan; Brons, Glen; Reynolds, Steve N.; Culross, Claude C.; and Neskora, Dan R., 5,151,173, Cl. 208-430.000.

Rezek, Ron, to Beverly Hills Fan Company. Ceiling fan with interchangeable body. 5,151,011, Cl. 416-5.000.

Rheon Automatic Machinery Co., Ltd.: *See—*
Hayashi, Torahiko, 5,151,024, Cl. 425-141.000.

Rheox, Inc.: *See—*
Cody, Charles A.; and Magauran, Edward D., 5,151,155, Cl. 162-5.000.

Rhone-Poulenc Sante: *See—*
Cook, David C.; Hart, Terance W.; Mc Lay, Iain M.; Palfreyman, Malcolm N.; Sharp, Brian W.; and Walsh, Roger J. A., 5,151,436, Cl. 514-314.000.

Riahi, James H.: *See—*
Stoner, David J.; Sanger, Joseph M.; Pahoundis, Louis E.; and Riahi, James H., 5,150,991, Cl. 406-67.000.

Ribton, Colin N.: *See—*
Sanderson, Allan; and Ribton, Colin N., 5,151,571, Cl. 219-121.130.

Ricciardi, Mario, to Bell & Howell Company. Diverter mechanism for flat document conveyor system. 5,150,894, Cl. 271-302.000.

Rice, C. Arlyn, to ECC America Inc. Method for forming aggregated kaolin pigment. 5,151,124, Cl. 106-416.000.

Richardson, Bradley S.: *See—*
Whiteside, John F.; and Richardson, Bradley S., 5,150,877, Cl. 251-40.000.

Richter, Stefan, to Krones AG Hermann Kronseder Maschinenfabrik. Device for positioning bottles symmetrically to the rotational axes of bottle carriages in labeling machines and the like. 5,150,782, Cl. 198-394.000.

Ricoh Company, Ltd.: *See—*
Suzuki, Aimi; Azuma, Toshiaki; Kimura, Shigeaki; and Hosogi, Yasuyuki, 5,151,404, Cl. 503-200.000.

Riebel, Hans-Jochem: *See—*
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000.

Riedle, Ulrich, to Siemens Aktiengesellschaft. Interface means. 5,151,936, Cl. 379-403.000.

Rikken, Gerardus L. J. A.; and Seppen, Constance J. E., to U.S. Philips Corp. Device for doubling the frequency of a light wave. 5,151,965, Cl. 385-122.000.

Riley, Wendell D.; and Childs, Jerry D., to Halliburton Company. Composition and method for cementing a well. 5,151,203, Cl. 252-8.551.

Rindt, Klaus-Peter; and Scholtissek, Stephan, to Dragerwerk Aktiengesellschaft. Detector for enzymatically determining gas samples. 5,151,367, Cl. 435-288.000.

Rioja, Roberto J.: *See—*
Witters, Jeffrey J.; Cheney, Brian A.; and Rioja, Roberto J., 5,151,136, Cl. 148-689.000.

Rionde, Guy. Silo made of suspended sheets. 5,150,550, Cl. 52-192.000.

Rippey, Scott R., to Westinghouse Electric Corp. Programmable device for integrated circuits. 5,151,611, Cl. 307-202.100.

Rippley, Martsey D. Disposable microwave cooking utensil. 5,151,568, Cl. 219-10.55E.

Ritchey, Mary F.: *See—*
Elberson, Joyce E.; and Ritchey, Mary F., 5,150,477, Cl. 2-114.000.

Ritt, Peter M.: *See—*
Wetzel, Charles M.; Ritt, Peter M.; Roberts, Owen H., Jr.; and Stork, Harry R., 5,151,337, Cl. 430-28.000.

Riviere, Luc, to France Telecom Etablissement Autonome de Droit Public (Centre National d'Etudes des Telecommunications). Polarization beam splitter for guided light. 5,151,957, Cl. 385-41.000.

Robbins, Bruce A.: *See—*
Lobb, Ernest W.; Robbins, Bruce A.; and Depew, David L., 5,150,656, Cl. 104-162.000.

Robbins, Douglas J.; Gosselin, Cynthia A.; and Myers, Frederick A., to Armco Steel Company, L.P. Thermoplastic acrylic-coated steel sheet. 5,151,297, Cl. 427-46.000.

Robbins, Walter A. Auxiliary power supply for continuation of computer system operation during commercial AC power failure. 5,151,907, Cl. 371-66.000.

Roberson, James H. Textile fiber length sorting apparatus and method. 5,150,502, Cl. 19-105.000.

Robert Bosch GmbH: *See—*
Kleinhans, Josef, 5,150,611, Cl. 73-204.140.
Kohler, Rolf; Kratt, Alfred; and Franzke, Klaus, 5,150,698, Cl. 123-690.000.
Kull, Hermann; Berger, Joachim; Gerstung, Ulrich; and Bleuel, Klaus, 5,150,681, Cl. 123-399.000.
Marek, Jiri; Bantien, Frank; Haack, Dietmar; and Warth, Martin, 5,151,763, Cl. 357-26.000.
Nothdurft, Heinz; Trunk, Reinhard; Sprenger, Kurt; and Alvarez-Avila, Carlos, 5,150,688, Cl. 123-506.000.
Paganon, Henri; and Pichon, Guy, 5,150,687, Cl. 123-490.000.
Peter, Cornelius, 5,150,679, Cl. 123-397.000.

Roberts, Donel L. Lawn sprinkler system. 5,150,838, Cl. 239-201.000.

Roberts, Owen H., Jr.: *See—*
Wetzel, Charles M.; Ritt, Peter M.; Roberts, Owen H., Jr.; and Stork, Harry R., 5,151,337, Cl. 430-28.000.

Robinson, Quentin K.: *See—*
Fishler, Mark K.; Rancoule, Gilbert; Park, Han K.; and Robinson, Quentin K., 5,151,201, Cl. 222-600.000.

Robles, Michel N.: *See—*
Law, Robert J.; Robles, Michel N.; and Snyder, Dane T., 5,151,244, Cl. 376-245.000.

Rockwell International Corporation: *See—*
Zappella, Pierino I., 5,151,389, Cl. 437-226.000.

Rodriquez, Callista M.: *See—*
Maher, David L.; Rodriquez, Callista M.; and Trahan, Paul A., 5,151,556, Cl. 89-35.010.

Roederer, Antoine; and Van't Klooster, Cornelis, to Agence Spatiale Europeene. Apparatus for electronically controlling the radiation pattern of an antenna having one or more beams of variable width and/or direction. 5,151,706, Cl. 342-372.000.

Roesky, Werner; Deffner, Dieter; and Wolter, Manfred, to Sante Corporation. Method of disposing of salt-containing dusts from incinerator plants. 5,150,985, Cl. 405-128.000.

Roglin, Robert L.; and Hanagud, Sathyanaraya, to Georgia Tech Research Corporation. Variable camber control of airfoil. 5,150,864, Cl. 244-219.000.

Rohm Co., Ltd.: *See—*
Sawada, Kikuzo, 5,151,906, Cl. 371-51.100.

Rohm and Haas Company: *See—*
Amick, David R., 5,151,447, Cl. 514-627.000.

Rohr, Wolfgang. Process and apparatus for depositing silt on the bottom and slopes of the wet open working or dredging. 5,150,986, Cl. 405-223.000.

Roll Systems, Inc.: *See—*
Crowley, H. W., 5,150,560, Cl. 53-411.000.

Rolls-Royce plc: *See—*
Hough, Geoffrey S., 5,151,012, Cl. 416-95.000.

Rollwitz, William L.; De Los Santos, Armando; Perry, William D.; Burrahm, Robert W.; and Davis, James K., to Southwest Research Institute. Telemetric measuring device with high power generation. 5,151,695, Cl. 340-870.330.

Romeo, Ernest A.: *See—*
Commins, Alfred D.; and Romeo, Ernest A., 5,150,553, Cl. 52-264.000.

Roncero, Jose I.: *See—*
Adkins, Wayne B.; and Roncero, Jose I., 5,150,719, Cl. 131-96.000.

Rooks, George E. Yarn cabinet. 5,150,794, Cl. 206-574.000.

Roos, Mark G., to Allied-Signal Inc. Method and apparatus for improved automatic fequency control. 5,151,703, Cl. 342-199.000.

Roques, Daniel; Pouysegur, Michel; and Cazaux, Jean-Louis, to Alcatel Espace. Dual-gate FET attenuator controlled by a variable load circuit. 5,151,669, Cl. 333-81.00R.

Rosati, Robert J.: *See—*
Goldberg, Jack; and Rosati, Robert J., 5,150,969, Cl. 374-128.000.

Rose Manufacturing Company: *See—*
Olson, Wayne L.; and Choate, Gary E., 5,150,768, Cl. 182-234.000.

Rosen, Arye; and Walinsky, Paul. Microwave aided balloon angioplasty with guide filament. 5,150,717, Cl. 128-804.000.

Rosenberg, Saul H.; and Denissen, Jon F., to Abbott Laboratories. Renin inhibitors. 5,151,422, Cl. 514-252.000.

Roshanravan, Mel; and Grosskopf, Michael W., to Darling-Delaware Company, Inc. Method and apparatus for dissolved air flotation with aeration. 5,151,177, Cl. 210-194.000.

Ross, Earl W.: *See—*
Austin, Curtiss M.; Darolia, Ramgopal; O'Hara, Kevin S.; and Ross, Earl W., 5,151,249, Cl. 420-445.000.

Rotex, Inc.: *See—*
Pierson, Bruce A., 5,150,796, Cl. 209-370.000.

Roth, Steven C.: *See—*
Bur, Anthony J.; Lowry, Robert E.; Roth, Steven C.; Thomas, Charles L.; and Wang, Francis W., 5,151,748, Cl. 356-32.000.

Rothman, Isaac: *See—*
Matkovich, Vlado I.; Degen, Peter J.; Gsell, Thomas C.; Bormann, Thomas; and Rothman, Isaac, 5,151,192, Cl. 210-646.000.

Rotoloni, Francis A.: *See—*
Andrews, Jack E.; Harmel, Roman J.; Lochkovic, Gregory A.; and Rotoloni, Francis A., 5,151,306, Cl. 427-434.500.

Rotsaert, Henri L. Blanks for the manufacture of artificial teeth and crowns. 5,151,044, Cl. 433-229.000.

Rowe, Neal E., to Westinghouse Electric Corp. Operating mechanism for a circuit breaker. 5,151,564, Cl. 200-17.00R.

Roy, Robert D.: *See—*
Powers, Kelly R.; Curtis, Tony G.; Limaye, Santosh Y.; and Roy, Robert D., 5,151,660, Cl. 324-689.000.

Royal Canadian Mint: *See—*
Truong, Hieu C.; and Dilay, Maria, 5,151,167, Cl. 205-102.000.

Royal, Claude S. System to automatically drain filter backwash water. 5,151,175, Cl. 210-108.000.

Rucker, Joie. Method and apparatus for application of finger & toenail coatings. 5,150,726, Cl. 132-285.000.

Rudolf, Karl; and Lehrieder, Gunter, to Diehl GmbH & Co. Ammunition possessing a supporting member constituted from a foam material. 5,151,558, Cl. 102-476.000.

Rudolf, William B. Retractable steering device for cargo barges that increases maneuverability by providing a pivot point or points when altering course. 5,150,661, Cl. 114-26.000.

Rueter, Rodney N.: *See—*
Bach, Ulf-Eiel F.; Rueter, Rodney N.; and Taylor, John N., 5,151,179, Cl. 210-250.000.

Ruffoni, John M., to McDonnell Douglas Corporation. Foam absorber. 5,151,222, Cl. 252-511.000.

Ruhl, Harry D., Jr.: *See—*
Lange, Sandra V.; Denton, David P.; Weller, Joseph P.; Chauvel, Jean P., Jr.; Farquharson, Stuart; Ruhl, Harry D., Jr.; and Winter, Gregory A., 5,151,474, Cl. 526-60.000.

Ruhrkohle AG: *See—*
Wessiepe, Klaus; and Stewen, Wilhelm, 5,150,543, Cl. 49-477.000.

Ruin, Jean: *See—*
Bernard, Jean; and Ruin, Jean, 5,150,853, Cl. 242-283.000.

Ruoff, Gottfried: *See—*
Masur, Ernst; Ruoff, Gottfried; and Planek, Werner, 5,150,973, Cl. 384-448.000.

Rush, William B., II; Elder, Jack E.; and Shier, Richard K., to General Motors Corporation. Pressure relief means for integrated induction system. 5,150,669, Cl. 123-52.0MF.

Rutherford, Howard J., to International Flavors & Fragrances Inc. Multi-layer scent emitting article and device adapted to employ same. 5,150,722, Cl. 131-335.000.

Ruthers, Richard A.: *See—*
Argent, Ronald D.; Ruthers, Richard A.; and Webber, Roy A., 5,151,918, Cl. 373-27.000.

Rutsch, Werner: *See—*
Babiarz, Joseph E.; and Rutsch, Werner, 5,151,459, Cl. 524-255.000.

RXS Schrumpftechnik-Garnituren GmbH: *See—*
Kaeufe, Helmut; and Kipfelsberger, Christian, 5,151,152, Cl. 156-645.000.

Ryan, David M., to United States of America, Air Force. Cathode material for electrochemical cells. 5,151,335, Cl. 429-223.000.

Ryan, Debra A.: *See—*
Zey, Edward G.; Shockley, Thomas H.; Ryan, Debra A.; and Moss, Gary L., 5,151,551, Cl. 562-494.000.

Rye, Grover W.: *See—*
Lunieski, Chester E.; and Rye, Grover W., 5,151,141, Cl. 152-544.000.

Rymut, Michael J.; Cooper, Stephen R. W.; and Washeleski, John M., to Nartron Corporation. Liquid level sensor. 5,150,615, Cl. 73-313.000.

Ryobi Motor Products Corporation: *See—*
McCurry, Ronald C., 5,150,523, Cl. 30-228.000.

Ryoka Techno Engineering & Construction Co.: *See—*
Seiryo, Furuto, 5,151,190, Cl. 210-640.000.

Ryono, Denis E.: *See—*
Weller, Harold N., III; and Ryono, Denis E., 5,151,513, Cl. 544-139.000.

Ryotaro Kamikawai: *See—*
Goto, Eiichi; Hioe, Willy; Hosoya, Mutsumi; and Kamikawai, Ryotaro, 5,151,617, Cl. 307-462.000.

S.E.M.T. Pielstick: *See—*
Magnet, Jean-Louis, 5,150,682, Cl. 123-417.000.

S.L.T. Japan Co., Ltd.: *See—*
Daikuzono, Norio, 5,151,097, Cl. 606-15.000.

Sab Wabco Holdings, B.V.: *See—*
Adamson, John, 5,150,774, Cl. 188-218.0XL.

Sackmann, David J.: *See—*
Bronikowski, Joseph T.; Hill, Brian T.; Sackmann, David J.; and Weber, Mark S., 5,151,978, Cl. 395-200.000.

Sadananda, Kuntimadi: *See—*
Provenzano, Virgil; Singh, Anand K.; Imam, M. A.; Sadananda, Kuntimadi; and Henshaw, William F., 5,151,407, Cl. 505-1.000.

Sadd, Andrea L.: *See—*
Bartholomew, Roger F.; and Sadd, Andrea L., 5,151,117, Cl. 65-3.120.

Saddleman, Inc.: *See—*
Croshaw, Steven P., 5,150,947, Cl. 297-229.000.

Sadler, William G., to Gewald, Harold W. Radial internal combustion engine. 5,150,670, Cl. 123-55.00R.

SAES Getters SpA: *See—*
Solcia, Carolina; and Succi, Marco, 5,151,251, Cl. 422-119.000.
Succi, Marco; and Doni, Fabrizio, 5,150,604, Cl. 73-38.000.

Sagami Chemical Research Center: *See—*
Fuchikami, Takamasa; and Urata, Hisao, 5,151,535, Cl. 554-226.000.

Sage Products, Inc.: *See—*
Hanifl, Paul H., 5,151,094, Cl. 604-902.000.

Saimi, Tetsuo; and Momoo, Kazuo, to Matsushita Electric Industrial Co., Ltd. Optical head device using cross-polarized from a light source for use in optical disk system. 5,151,889, Cl. 369-44.370.

St. Denis, Lucen, to E. R. St. Denis & Sons, Limited. Hemming machine and method. 5,150,508, Cl. 29-463.000.

St-Germain, Jean. Wind machine with electric generators and secondary rotors located on rotating vertical blades. 5,151,610, Cl. 290-55.000.

St. Pierre, Richard C.: *See—*
Serkes, Jonathan M.; and St. Pierre, Richard C., 5,151,366, Cl. 435-285.000.

Saita, Seiji, to Kabushiki Kaisha Yamada Corp. Reciprocating actuator. 5,150,643, Cl. 91-229.000.

Saito, Akira: *See—*
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000.

Saito, Tomoki: *See—*
Atsumi, Kiminori; Saito, Tomoki; and Komori, Masaaki, 5,151,122, Cl. 106-35.000.

Saito, Yutaka: *See—*
Nakano, Hirofumi; Kawada, Shozo; Uosaki, Yoichi; Saito, Yutaka; Gomi, Katsushige; and Iwazaki, Toshiaki, 5,151,352, Cl. 435-123.000.

Saitoh, Shin'ichiro: *See—*
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,151,409, Cl. 505-1.000.

Sakaguchi, Katsuyoshi: *See—*
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.

Sakaguchi, Kazuhiko: *See—*
Koden, Mitsuhiro; Kuratate, Tomoaki; Funada, Fumiaki; Sakaguchi, Kazuhiko; and Kitamura, Tohru, 5,151,214, Cl. 252-299.610.

Sakai, Hideyuki, to Nichidai Industrial Co. Ltd.; and Daiwa Paint Trading Co. Ltd. Horizontally flexible rail. 5,150,655, Cl. 104-89.000.

Sakai, Hiroyuki: *See—*
Matsumura, Kimiharu; Sakai, Hiroyuki; Murakami, Masaaki; Oda, Tetsuya; and Yamaguchi, Chizo, 5,151,871, Cl. 364-557.000.

Sakai, Katsuyuki: *See—*
Kida, Shigeru; and Sakai, Katsuyuki, 5,150,630, Cl. 74-354.000.

Sakai, Tatsuro: *See—*
Yanagisawa, Shuichi; Sakai, Tatsuro; Murata, Yasushi; Matsui, Fumio; and Mitoh, Yasuo, 5,151,310, Cl. 428-64.000.

Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiro; Hirashima, Isao; and Ushijima, Kazuhiro, to Mazda Motor Corporation. Air bag system for vehicle. 5,150,919, Cl. 280-732.000.

Sakama, Masao: *See—*
Suzuki, Hideo; Matsushima, Shunichi; Masubuchi, Takamichi; Obata, Masahiko; and Sakama, Masao, 5,151,553, Cl. 84-600.000.

Sakamoto, Masahiro; and Kataoka, Junnosuke, to Canon Kabushiki Kaisha. Scanning device having a memory for storing driving steps for a stepping motor. 5,151,640, Cl. 318-696.000.

Sakamoto, Nobuyuki: *See—*
Miyanaga, Hirofumi; Sakamoto, Nobuyuki; Yoshimitsu, Koichi; and Tanaka, Yasundo, 5,150,702, Cl. 128-6.000.

Sakamoto, Noriyasu; Kisida, Hirosi; Fujimoto, Hiroaki; Umeda, Kimitoshi; and Matsuo, Noritada. Pyridine derivatives and their compositions for the control of insect pests. 5,151,428, Cl. 514-277.000.

Sakamoto, Shuji: *See—*
Shigematsu, Kazuyoshi; Nakagawa, Takashi; and Sakamoto, Shuji, 5,151,531, Cl. 552-115.000.

Sakane, Katsunobu: *See—*
Fujita, Yoshiyuki; and Sakane, Katsunobu, 5,150,920, Cl. 280-777.000.

Sakanoue, Kei; and Hirano, Tsumoru, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,151,356, Cl. 430-548.000.

Sakashita, Takeshi; and Shimoda, Tomoaki, to GE Plastics Japan, Ltd. Catalytic melt condensation preparation of polycarbonate. 5,151,491, Cl. 528-199.000.

Sakata, Matsumi; Kumura, Tatsuo; Suzuki, Atsushi; Ikeda, Yoshito; Aoki, Kaoru; Kojima, Naoto; and Mishima, Akio, to Sony Corporation. Method for manufacturing a magnetic transducer head. 5,150,511, Cl. 29-603.000.

Sakita, Yuzo: *See—*
Eguchi, Takaaki; and Sakita, Yuzo, 5,150,764, Cl. 180-141.000.

Saklad, Betty E., to Selandia Designs. Drink container. 5,150,815, Cl. 220-708.000.

Sakuhara, Hirohiko: *See—*
Shinji, Yasuhisa; Hasegawa, Toshiaki; Akune, Shinichi; and Sakuhara, Hirohiko, 5,151,053, Cl. 439-610.000.

Sakuma, Isao: *See—*
Suzuki, Shohei; and Sakuma, Isao, 5,151,982, Cl. 395-425.000.

Sakurai, Hiromi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Revolute welding robot. 5,151,570, Cl. 219-86.250.

Sakurai, Tomohisa; and Gotanda, Masakazu, to Olympus Optical Co., Ltd. Apparatus for generating ultrasonic oscillation. 5,151,085, Cl. 604-22.000.

Salamy, Thomas E.; Love, Marvin L., Jr.; and Towner, Mark E., to OCG Microelectronic Materials, Inc. Use of particular mixtures of ethyl lactate and methyl ethyl ketone to remove undesirable peripheral material (e.g. edge beads) from photoresist-coated substrates. 5,151,219, Cl. 252-364.000.

Salbaum, Johannes M. H.; Masters, Colin L.; and Beyreuter, Konrad T., to Molecular Therapetuics, Inc. Promoter region for DNA sequences which encode the precursor of the human A4 amyloid protein. 5,151,508, Cl. 536-27.000.

Salidrigas, Cecilia. Restraining apparatus for small animals. 5,150,667, Cl. 119-96.000.

Saltman, Paul D.; and Smith, Kenneth T., to Procter & Gamble Company, The; and University of California, Regents of the. Calcium and trace mineral supplements. 5,151,274, Cl. 424-630.000.

Salzmann, Thomas N.: *See*—
DiNinno, Frank P.; Greenlee, Mark L.; and Salzmann, Thomas N., 5,151,512, Cl. 540-302.000.
Steinberg, Nathan G.; Rasmusson, Gary H.; and Salzmann, Thomas N., 5,151,430, Cl. 514-284.000.
Samain, Daniel; Bec, Jean-Louis; Cohen, Edith; Nguyen, Frederique; and Peyrot, Marianne, to Centre National de la Recherche Scientifique. Particulate vector useful in particular for the transport of molecules with biological activity and process for its preparation. 5,151,264, Cl. 424-1.100.
Samsung Electronics Co., Ltd.: *See*—
Jeong, Ho-sun; and Han, Hyo-jin, 5,151,874, Cl. 364-752.000.
Kim, Jong-Hae, 5,151,668, Cl. 332-124.000.
Park, Young-Jun, 5,151,787, Cl. 358-162.000.
Suh, Young S., 5,151,569, Cl. 219-10.55F.
Samukawa, Koji: *See*—
Seki, Masaki; Samukawa, Koji; and Hanaoka, Osamu, 5,151,864, Cl. 364-474.230.
Sanborn, Charles H., III: *See*—
Cole, William R., Jr.; Sanborn, Charles H., III; and Clanton, J. Dwight, 5,151,077, Cl. 493-353.000.
Sander, Brian: *See*—
Sander, Wendell; and Sander, Brian, 5,151,985, Cl. 395-500.000.
Sander, Wendell; and Sander, Brian, to Apple Computer, Inc. Disk drive controller. 5,151,985, Cl. 395-500.000.
Sanders, Ian L.: *See*—
Bleich, Herman E.; Franco, Luis P.; and Sanders, Ian L., 5,151,294, Cl. 427-11.000.
Sanders, Joseph; Mafoti, Robson; and Markusch, Peter H., to Miles Inc. Aminocrotonates as curing agents for epoxy resins. 5,151,470, Cl. 525-407.000.
Sanderson, Allan; and Ribton, Colin N., to Welding Institute, The. Electron beam welding. 5,151,571, Cl. 219-121.130.
Sanderson, John R.: *See*—
Marquis, Edward T.; Sanderson, John R.; and Meyer, Robert A., 5,151,530, Cl. 549-529.000.
Sandhu, Gurtej S., to Micron Technology, Inc. Method to form self-aligned tips for flat panel displays. 5,151,061, Cl. 445-24.000.
Sandoz Ltd.: *See*—
Henrick, Clive A., 5,151,443, Cl. 514-486.000.
Sandvik AB: *See*—
Haglund, Bengt O.; and During, Bengt N., 5,151,247, Cl. 419-13.000.
Sanetra, Jurgen; and Schaag, Heinrich, to Minnesota Mining and Manufacturing Company. Sensitizer for ferromagnetic markers used with electromagnetic article surveillance systems. 5,151,843, Cl. 361-149.000.
Sanger, Joseph M.: *See*—
Stoner, David J.; Sanger, Joseph M.; Pahoundis, Louis E.; and Riahi, James H., 5,150,991, Cl. 406-67.000.
Sankyo Company, Limited: *See*—
Sato, Aiya; Sugano, Michihiro; Furuya, Kouhei; Oshima, Takeshi; Kuwano, Harumitsu; Hata, Tadashi; and Haruyama, Hideyuki, 5,151,529, Cl. 549-354.000.
Sano, Shoichi: *See*—
Yoshida, Suguru; Tsunoda, Isao; and Sano, Shoichi, 5,150,944, Cl. 296-203.000.
Sanofi: *See*—
Garcia, Georges; Di Malta, Alain; and Soubrie, Philippe, 5,151,442, Cl. 514-456.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Hoshiba, Akihiro; Okazaki, Masaki; and Hasegawa, Junichi, 5,150,673, Cl. 123-179.150.
Santangelo, Francesco: *See*—
Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, 5,151,414, Cl. 514-114.000.
Sante Corporation: *See*—
Roesky, Werner; Deffner, Dieter; and Wolter, Manfred, 5,150,985, Cl. 405-128.000.
Santel, Hans-Joachim: *See*—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000.
Santerre, Robert F.: *See*—
Bang, Nils U.; Beckmann, Robert J.; Jaskunas, S. Richard; Lai, Mei-Huei T.; Little, Sheila P.; Long, George L.; and Santerre, Robert F., 5,151,268, Cl. 424-94.640.
Sanwa Electronics Instrument Co., Ltd.: *See*—
Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, 5,151,696, Cl. 341-22.000.
Sanz, Gerard C.: *See*—
Venet, Marc G.; Sanz, Gerard C.; Raeymaekers, Alfons H. M.; and Freyne, Eddy J. E., 5,151,421, Cl. 514-249.000.
Sanzen, Satoru: *See*—
Hanatani, Tadashi; Sanzen, Satoru; and Deguchi, Jichio, 5,151,324, Cl. 428-323.000.
Saotome, Shigeru, to Fuji Photo Film Co., Ltd. Method and apparatus for detecting the location of a pattern in a radiation image stored on a stimulable phosphor sheet. 5,151,596, Cl. 250-327.200.
Sarasmo, Jukka: *See*—
Vaisanen, Risto; Sarasmo, Jukka; and Pekkarinen, Vesa, 5,152,004, Cl. 455-68.000.
Sarich, Ralph T.: *See*—
McKay, Michael L.; Thompson, Ian R.; and Sarich, Ralph T., 5,150,836, Cl. 239-5.000.
Sarter, Celia; and Sarter, Rick. Training cap for nursing bottles. 5,150,800, Cl. 215-11.400.
Sarter, Rick: *See*—
Sarter, Celia; and Sarter, Rick, 5,150,800, Cl. 215-11.400.
Sarubbi, Thomas R., to OCG Microelectronic Materials, Inc. Photoresist composition containing diazoquinone photosensitizer and novalak resin characterized by the complete and selective removal of dimeric species from the novolak resin. 5,151,339, Cl. 430-192.000.
Saruta, Masahiro: *See*—
Ikeda, Hiroyuki; Shinka, Michitoshi; Tayama, Suehiro; Sawano, Tetuya; and Saruta, Masahiro, 5,151,482, Cl. 526-329.700.
Sasaki, Akira; Kato, Takeshi; and Hakoyama, Akiyoshi, to Hitachi, Ltd. Printing apparatus and information processing apparatus using the same. 5,151,973, Cl. 395-109.000.
Sasaki, Hideaki: *See*—
Matsui, Kiyoshi; Satoh, Ryohei; Netsu, Toshitada; Sasaki, Hideaki; Shirai, Mitugu; and Hamamura, Kenichi, 5,151,773, Cl. 357-74.000.
Sasaki, Hidemi, to Fuji Photo Film Co., Ltd. Battery coupler. 5,151,727, Cl. 354-76.000.
Sasaki, Kunitsuna: *See*—
Kumamoto, Kenji; and Sasaki, Kunitsuna, 5,151,330, Cl. 428-425.900.
Sasaki, Seiji: *See*—
Tanaka, Ichiro; Sasaki, Seiji; Kakubari, Zen-ichi; and Kojima, Osamu, 5,151,063, Cl. 454-258.000.
Sasaki, Shinichi: *See*—
Tsuda, Tadayuki; Watanabe, Kazushi; Ikemoto, Isao; and Sasaki, Shinichi, 5,151,734, Cl. 355-200.000.
Sasaki, Yoshihiro: *See*—
Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshihiro, 5,151,035, Cl. 439-95.000.
Sasaki, Yoshio, to Pioneer Electronic Corporation. Circuit for muting noises for an audio amplifier. 5,151,942, Cl. 381-94.000.
Sasaki, Yoshiro: *See*—
Kawai, Mitsuru; Yoshida, Masaru; and Sasaki, Yoshiro, 5,151,033, Cl. 439-95.000.
Sasama, Kazuo: *See*—
Nosaki, Takefumi; and Sasama, Kazuo, 5,151,797, Cl. 358-474.000.
Sasanami, Hiromitsu: *See*—
Hirakawa, Tadao; Tamura, Sachio; and Sasanami, Hiromitsu, 5,151,118, Cl. 65-18.100.
Sasano, Akira: *See*—
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.
Sasashige, Hiroaki: *See*—
Seki, Yukuharu; Sasashige, Hiroaki; and Ohkawa, Haruo, 5,150,514, Cl. 29-824.000.
Sasho, Manabu; Yamauchi, Hiroshi; Yamanaka, Motosuke; Nakamura, Takaharu; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; and Negi, Shigeto, to Eisai Co., Ltd. 3-substituted vinyl cephalosporin derivatives. 5,151,417, Cl. 514-202.000.
Sassy, Inc.: *See*—
Cohen, Carl M., 5,150,504, Cl. 24-302.000.
SAT (Societe Anonyme de Telecommunications): *See*—
Baillet, Gerard, 5,151,815, Cl. 359-220.000.
Sato, Aiya; Sugano, Michihiro; Furuya, Kouhei; Oshima, Takeshi; Kuwano, Harumitsu; Hata, Tadashi; and Haruyama, Hideyuki, to Sankyo Company, Limited. Platelet activating factor antagonists, named "the phomactins" their preparation and use. 5,151,529, Cl. 549-354.000.
Sato, Hiroshi; and Yoshioka, Hiroshi, to Sumitomo Chemical Co., Ltd. Process for producing organic carboxylic acid esters. 5,151,547, Cl. 560-205.000.
Sato, Kaoru: *See*—
Inuyama, Toshihiko; Kimizuka, Junichi; Abe, Makoto; Kusano, Akihisa; Sato, Kaoru; Okazawa, Kazuhiko; Ishizu, Masanori; and Ito, Toshiyuki, 5,151,910, Cl. 372-31.000.
Sato, Kazuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Diversity reception control circuit. 5,152,009, Cl. 455-134.000.
Sato, Kensaku, to Hirose Electric Co., Ltd. Failsafe electrical connector. 5,151,048, Cl. 439-357.000.
Sato, Maki: *See*—
Imai, Isamu; Yotsumoto, Toshihiro; Inada, Norio; Toki, Shigeyuki; Sato, Maki; and Wada, Ichiro, 5,151,142, Cl. 152-565.000.
Sato, Masahiko: *See*—
Yamazaki, Shunpei; and Sato, Masahiko, 5,151,808, Cl. 359-78.000.
Sato, Mitsuo; Shaura, Hazime; and Tateishi, Megumi, to Kabushiki Kaisha Toshiba. Resin molding apparatus. 5,151,276, Cl. 425-110.000.
Sato, Shougo; Ohashi, Tsuyoshi; and Hirahata, Shinichi, to Brother Kogyo Kabushiki Kaisha. Scanning exposure device provided with intensity correction to compensate for scan angle. 5,151,586, Cl. 250-205.000.
Sato, Shouichi, to Fujitsu Limited. Film resistance terminator. 5,151,676, Cl. 338-61.000.
Sato, Tai, to C-Cube Microsystems, Inc. MOS array multiplier cell. 5,151,875, Cl. 364-784.000.
Sato, Yasushi: *See*—
Ohzeki, Yukihiro; Araya, Junji; Ishiyama, Tatsunori; Sato, Yasushi; and Nakahata, Kimio, 5,151,736, Cl. 355-208.000.
Satoh, Ryohei: *See*—
Matsui, Kiyoshi; Satoh, Ryohei; Netsu, Toshitada; Sasaki, Hideaki; Shirai, Mitugu; and Hamamura, Kenichi, 5,151,773, Cl. 357-74.000.

Satou, Hiroki; and Horinouchi, Kazuyuki, to Sharp Kabushiki Kaisha. Large scale integrated circuit device for switching oscillation circuit. 5,151,613, Cl. 307-243.000.

Satoya, Koichi: *See—*
Ohnaka, Hidemi; Tanaka, Masaaki; Kato, Yuuichi; Furuhashi, Michio; Satoya, Koichi; and Ooi, Yasuhiro, 5,150,693, Cl. 123-559.300.

Saturn Corporation: *See—*
Gray, Charles A.; Milunas, Rimas S.; and Nitz, Larry T., 5,151,855, Cl. 395-750.000.
Milunas, Rimas S.; and Nitz, Larry T., 5,151,858, Cl. 364-424.100.

Saukel, Heinz: *See—*
Gaeng, Manfred; Saukel, Heinz; Hoffmann, Wolfgang; and Koenig, Josef, 5,151,523, Cl. 548-217.000.

Saulnier, Gary J.: *See—*
Chennakeshu, Sandeep; and Saulnier, Gary J., 5,151,926, Cl. 375-84.000.

Savio S.p.A.: *See—*
Colli, Luigi; and Badiali, Roberto, 5,150,845, Cl. 242-35.50A.

Savitsky, Wallace R.: *See—*
Warner, Gary N.; White, Jason L.; Haley, Edmund J.; Savitsky, Wallace R.; and Schaffer, Ronald R., 5,151,960, Cl. 385-53.000.

Sawada, Jiro: *See—*
Kajigaya, Kazuhiko; and Sawada, Jiro, 5,151,881, Cl. 365-233.000.

Sawada, Kazuo; Okura, Kengo; Yoshida, Noriyuki; Takano, Satoshi; Miyazaki, Kenji; and Hayashi, Noriki, to Sumitomo Electric Industries, Ltd. Laminated superconductor. 5,151,406, Cl. 505-1.000.

Sawada, Kikuzo, to Rohm Co., Ltd. Semiconductor memory device having self-correcting function. 5,151,906, Cl. 371-51.100.

Sawada, Tomoyuki: *See—*
Hirao, Akihiko; Sawada, Tomoyuki; Takayama, Shinji; Aoyama, Youichi; Matsuoka, Yukihiro; and Hiroshima, Tatsuo, 5,151,671, Cl. 335-172.000.

Sawada, Tsuguo: *See—*
Takamoto, Ryuichi; Nanba, Ryujiro; Matsuoka, Masahiro; and Sawada, Tsuguo, 5,151,590, Cl. 250-215.000.

Sawano, Tetuya: *See—*
Ikeda, Hiroyuki; Shinka, Michitoshi; Tayama, Suehiro; Sawano, Tetuya; and Saruta, Masahiro, 5,151,482, Cl. 526-329.700.

Sawdon, Edwin G., to BTM Corporation. Apparatus for joining sheet material. 5,150,513, Cl. 29-798.000.

Sayad, Fouad-Michel. Combination bottle carrier and rack. 5,150,784, Cl. 206-202.000.

Scaramucci, John P. Compact swing check valve. 5,150,733, Cl. 137-454.200.

Scaros, Mike G.: *See—*
Behling, James R.; Farid, Payman; Khanna, Ish; Medich, John R.; Prunier, Mike; Scaros, Mike G.; and Weier, Richard M., 5,151,519, Cl. 546-219.000.

Schaefer, Rolf: *See—*
Hitz, Hans; Schaefer, Rolf; Baust, Heinrich; and Gross, Wolfgang, 5,151,522, Cl. 548-112.000.

Schaffer, Ronald R.: *See—*
Warner, Gary N.; White, Jason L.; Haley, Edmund J.; Savitsky, Wallace R.; and Schaffer, Ronald R., 5,151,960, Cl. 385-53.000.

Schaper & Bruemmer GmbH & Co. KG: *See—*
Beuscher, Norbert; and Scheit, Karl-Heinz, 5,151,498, Cl. 530-372.000.

Schasfoort, Egbertus F. P.: *See—*
Szabo, Georges; Schasfoort, Egbertus F. P.; and Milan, Alain, 5,151,400, Cl. 502-203.000.

Scheit, Karl-Heinz: *See—*
Beuscher, Norbert; and Scheit, Karl-Heinz, 5,151,498, Cl. 530-372.000.

Schering Aktiengesellschaft: *See—*
Buback, Michael; Hader, Josef; Voegele, Hans-Peter; and Al-Massri, ZaKarya, 5,151,533, Cl. 552-625.000.

Schering Corporation: *See—*
Piwinski, John J.; Green, Michael J.; and Wong, Jesse, 5,151,423, Cl. 514-254.000.

Schiehser, Guy A.: *See—*
Caufield, Craig E.; and Schiehser, Guy A., 5,151,413, Cl. 514-63.000.

Schiel, Christian, to J. M. Voith GmbH. Suction roll with deflector pieces in the holes, for a dryer group of a paper making machine. 5,151,156, Cl. 162-368.000.

Schiettecatte, Patrice J. C., to Moulinex (Societe Anonyme). Filter holder for a coffee machine of the "espresso" type. 5,150,645, Cl. 99-295.000.

Schlecht, Klaus; and Wehrspann, Olaf, to Nestec S.A. Process for increasing coffee extraction yield. 5,151,287, Cl. 426-432.000.

Schlecker, Rainer; Teschendorf, Hans-Juergen; and Unger, Liliane, to BASF Aktiengesellschaft. Benzofurancarboxamides having basic substituents and therapeutic agents containing the same. 5,151,437, Cl. 514-320.000.

Schlegel Corporation: *See—*
Burnett, Viola C., 5,150,544, Cl. 49-493.000.

Schleicher, Bernd: *See—*
Faerber, Manfred; Wienchol, Otto; and Schleicher, Bernd, 5,150,631, Cl. 74-422.000.

Schlumberger Industries: *See—*
Vinals, Manuel, 5,150,805, Cl. 220-217.000.

Schlumberger Industries, Limited: *See—*
Turner, John T.; and Popiel, Czeslaw O., 5,150,619, Cl. 73-861.220.

Schmalstieg, Lutz; Hihlein, Peter; Pedain, Josef; and Wieczorrek, Wolfhart, to Bayer Aktiengesellschaft. Isocyanate prepolymers containing ether and ester groups a process for their preparation and their use for the production of coating, sealing or casting composition. 5,151,484, Cl. 528-45.000.

Schmid, Rosemarie: *See—*
Noll, Klaus; Pedain, Josef; Zorn, Bruno; and Schmid, Rosemarie, 5,151,329, Cl. 428-423.400.

Schmidely, Herve : *See—*
Poulin, Jean-Marc; and Schmidely, Herve , 5,151,199, Cl. 210-773.000.

Schmidt, Annette M.: *See—*
Tomasov, Glenn E.; and Schmidt, Annette M., 5,150,584, Cl. 62-209.000.

Schmidt, Hans-Werner: *See—*
Beck, Karin H.; Etzbach, Karl-Heinz; and Schmidt, Hans-Werner, 5,151,516, Cl. 546-37.000.

Schmidt, Robert R.: *See—*
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000.

Schmucki, Peter, to Geberit AG. Support footing for toilet. 5,150,480, Cl. 4-252.300.

Schnitzer, Tadeusz E., to Du Pont de Nemours, E. I., and Company. High-speed cutter for yarns. 5,150,640, Cl. 83-583.000.

Scholl, Stephen R.: *See—*
Valentine, Michael D.; Groth, Clarence R.; Scholl, Stephen R.; and Nusair, Marwan E., 5,151,701, Cl. 342-20.000.

Scholtissek, Stephan: *See—*
Rindt, Klaus-Peter; and Scholtissek, Stephan, 5,151,367, Cl. 435-288.000.

Scholz, Christoph; and Sefalidis, Yassilios, to CS Halbleiter- und Solartechnologie GmbH. Sorption column for waste-gas cleaning. 5,151,116, Cl. 55-387.000.

Scholz, James P.; and Stahl, Daniel E., to AMP Incorporated. Cable assembly. 5,151,050, Cl. 439-456.000.

Schonenberger, Eric: *See—*
Pantale, David; and Schonenberger, Eric, 5,150,772, Cl. 188-72.400.
Valmir, Francis; Mazon, Yves; and Schonenberger, Eric, 5,151,681, Cl. 340-454.000.

Schoutteten, Bruno, to Schoutteten & Froidure S.A.; and S.A. Copel Industrie. Electrified tape for enclosure fences. 5,151,319, Cl. 428-257.000.

Schoutteten & Froidure S.A.: *See—*
Schoutteten, Bruno, 5,151,319, Cl. 428-257.000.

Schrader, Hartmut: *See—*
Baumeister, Joachim; and Schrader, Hartmut, 5,151,246, Cl. 419-2.000.

Schreck, John F.; and Truong, Phat C., to Texas Instruments Incorporated. Method and apparatus for determining the field position of an integrated circuit within a reticle area. 5,151,880, Cl. 365-201.000.

Schubert, Paul F.; Kubicek, Donald H.; and Kidd, Dennis R., to Phillips Petroleum Company. Preparation of dehydrogenating catalyst. 5,151,401, Cl. 502-329.000.

Schug, Heinrich: *See—*
Sanetra, Jurgen; and Schug, Heinrich, 5,151,843, Cl. 361-149.000.

Schulte-Elte, Karl-Heinrich: *See—*
Giersch, Wolfgang K.; Blanc, Pierre-Alain; and Schulte-Elte, Karl-Heinrich, 5,151,410, Cl. 512-9.000.

Schulte, Steven A.: *See—*
Marfilius, Donald F.; and Schulte, Steven A., 5,150,946, Cl. 297-194.000.

Schultz, Garth J.: *See—*
Porter, Fred C.; and Schultz, Garth J., 5,150,685, Cl. 123-478.000.

Schulz, Eberhard: *See—*
Findeis, Gunter; Jacob, Friedrich; and Schulz, Eberhard, 5,151,733, Cl. 355-45.000.

Schuster, Gary B.: *See—*
Gottschalk, Peter; Neckers, Douglas C.; and Schuster, Gary B., 5,151,520, Cl. 548-110.000.

Schutz, Jurg A.: *See—*
Bi, Junging; Beaud, Paul A.; Schutz, Jurg A.; Hodel, Walter; and Weber, Heinz P., 5,151,911, Cl. 372-32.000.

Schwabische Huttenwerke GmbH: *See—*
Zaoralek, Heinz-Michael, 5,151,576, Cl. 219-469.000.

Schwarz, Ricardo B.; and Kuokkala, Veli-Tapani, to United States of America, Energy. Magnetostrictive resonance excitation. 5,150,617, Cl. 73-579.000.

Schweitzer, Karl; and Zeindl, Gerhard, to Emhart, Inc. Tool exchange system for hybrid die bonder. 5,150,530, Cl. 33-626.000.

Schwob, Pierre R. Broadcast receiver capable of automatic station identification and format-scanning based on an internal database updatable via data reception over the airwaves. 5,152,011, Cl. 455-158.500.

Schwob, Pierre R. Broadcast receiver capable of automatically updating location and performing spiral searching. 5,152,012, Cl. 455-158.500.

Scott, Bruce A.: *See—*
Meyerson, Bernard S.; Scott, Bruce A.; and Wolford, Donald J., Jr., 5,151,383, Cl. 437;101-.

Scott Tech International, Inc.: *See—*
Bromley, Scott, 5,150,496, Cl. 29-33.00T.

Sczomak, David P.: *See—*
Currie, James H.; Peden, Richard A.; Sczomak, David P.; Mitchell, Mark A.; and Brown, Michael J., 5,150,694, Cl. 123-569.000.

Sears, Lawrence; and Wall, John T., to ITT Corporation. Variable speed hydromassage pump control. 5,151,017, Cl. 417-45.000.

Seaworth, Brian: *See*—
Blackmon, James B.; Drubka, Robert E.; Kirby, John S.; Johnson, Dave; Gerrick, R. Andrew; Ingersoll, Thomas; Jones, Nelson; Seaworth, Brian; and Glover, Gary, 5,150,748, Cl. 165-41.000.

Secci, Giovanni, to Contraves Italiana S.p.A. Recharge device, particularly for drive mechanisms for extending and withdrawing operative members of a space vehicle. 5,150,770, Cl. 185-40.00R.

Sedath, Robert H.; Taylor, Donald R.; and White, Lloyd S., to Allied-Signal Inc. Reduction of membrane fouling by surface fluorination. 5,151,183, Cl. 210-500.410.

Sedigh, Mohammad; Shyr, Richard; Shih, Edward; and Mitchell, Muni, to General Instrument Corp. Surface mountable rectifier and method for fabricating same. 5,151,846, Cl. 361-306.000.

Sefalidis, Yassilios: *See*—
Scholz, Christoph; and Sefalidis, Yassilios, 5,151,116, Cl. 55-387.000.

Seiko Corporation: *See*—
Hoff, Don G., 5,150,954, Cl. 340-825.440.

Seiko Epson Corp.: *See*—
Hoff, Don G., 5,150,954, Cl. 340-825.440.
Kakutani, Toshiaki; Yanase, Nobuyuki; Fukushima, Hitoshi; and Takahata, Toshiya, 5,151,741, Cl. 355-257.000.
Miyazawa, Osamu, 5,151,886, Cl. 368-157.000.
Yamazaki, Katsunori, 5,151,690, Cl. 340-784.000.
Yonekubo, Masatoshi, 5,151,890, Cl. 369-44.110.

Seiko Instruments Inc.: *See*—
Machida, Satoshi; Kawahara, Yukito; and Mukainakano, Hiroshi, 5,151,587, Cl. 250-208.100.
Suginoya, Mitsuru; Kamamori, Hitoshi; and Fukuchi, Takakazu, 5,151,379, Cl. 427-39.000.

Seiryo, Furuto, to Ryoka Techno Engineering & Construction Co.; and Mitsubishi Kasei Corporation. Method for separating a liquid mixture. 5,151,190, Cl. 210-640.000.

Seiter, John J., to PPG Industries, Inc. Process for producing 2-oxo-1,3-dibenzyl-4,5-cis-imidazolidinedicarboxylic acid. 5,151,525, Cl. 548-321.000.

Seitz Enzinger Noll Maschinenbau Aktiengesellschaft: *See*—
Bernhard, Herbert, 5,150,558, Cl. 53-167.000.

Seki, Koichi: *See*—
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.

Seki, Masaki; Samukawa, Koji; and Hanaoka, Osamu, to Fanuc Ltd. Method of generating cutting passes of complex curved surface. 5,151,864, Cl. 364-474.230.

Seki, Yasuharu: *See*—
Koyanagi, Osamu; Seki, Yasuharu; and Tsukushi, Masanori, 5,151,566, Cl. 200-110.00A.

Seki, Yukuharu; Sasashige, Hiroaki; and Ohkawa, Haruo, to Mitsubishi Jukogyo Kabushiki Kaisha. Corrugating roll unit exchanging apparatus for a single facer. 5,150,514, Cl. 29-824.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Ishihara, Makoto; Kiminami, Kazuhiro; Wakabayashi, Masakazu; Hori, Hirokazu; Tatsu, Saneharu; and Takeshita, Sachio, 5,151,234, Cl. 264-176.100.

Sekiya, Teruo; Kimura, Tomoaki; and Nishimura, Sadao, to Hitachi, Ltd. Hot strip plant. 5,150,597, Cl. 72-229.000.

Seko, Tsuyoshi: *See*—
Hiratani, Masahiko; Saitoh, Shin'ichiro; Miyauchi, Katsuki; Seko, Tsuyoshi; Nishino, Toshikazu; Nakane, Hideaki; Hatano, Mutsuko; and Hasegawa, Haruhiro, 5,151,409, Cl. 505-1.000.

Selandia Designs: *See*—
Saklad, Betty E., 5,150,815, Cl. 220-708.000.

Sellinger, Alan: *See*—
Hu, Ho-Pin; Katsnelson, Inessa; and Sellinger, Alan, 5,151,189, Cl. 210-635.000.

Semeraro, Claudio: *See*—
Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, 5,151,414, Cl. 514-114.000.

Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei; and Sato, Masahiko, 5,151,808, Cl. 359-78.000.

Sens, Ruediger: *See*—
Bach, Volker; Hansen, Guenter; Lamm, Gunther; and Sens, Ruediger, 5,151,506, Cl. 534-772.000.

Seppen, Constance J. E.: *See*—
Rikken, Gerardus L. J. A.; and Seppen, Constance J. E., 5,151,965, Cl. 385-122.000.

Serafin, Renato: *See*—
Tacchetto, Maurizio; Zorzi, Claudio; De Bortoli, Giuseppe; Pozzobon, Alessandro; and Serafin, Renato, 5,150,537, Cl. 36-50.500.

Serkes, Jonathan M.; and St. Pierre, Richard C., to Invitro Scientific Products, Inc. Cell culture flask. 5,151,366, Cl. 435-285.000.

Servo Corporation of America: *See*—
Bambara, Joseph E., 5,150,618, Cl. 73-660.000.

Seto, Shunichi, to Fuji Photo Film Co., Ltd. Method for detecting defects in measurement means of biochemical analysis apparatuses. 5,151,755, Cl. 356-414.000.

Sevenstrand Tackle Corporation: *See*—
Buchanan, William R., 5,150,538, Cl. 43-42.280.

Seyfried, Joseph A.; and Patel, Chetan G., to Xerox Corporation. Apparatus for storing marking particles. 5,150,807, Cl. 220-359.000.

SGS-Thomson Microelectronics, Inc.: *See*—
Brady, James; Chan, Tsiu C.; and Culver, David S., 5,151,387, Cl. 437-191.000.
Spinner, Charles R., III, 5,151,376, Cl. 437-47.000.

SGS-Thomson Microelectronics S.A.: *See*—
Artieri, Alain, 5,151,976, Cl. 395-166.000.

Shacklock, Frank W.: *See*—
Williams, John J. A.; Shacklock, Frank W.; and Ferguson, Keith D., 5,150,589, Cl. 68-23.700.

Shah, Bakulesh N.; Tran, Dung Q.; and Keene, Donna L., to Hoechst Celanese Corporation. Process for the production of 4-acetoxystyrene, its polymers and hydrolysis products. 5,151,546, Cl. 560-130.000.

Shaheen-Gouda, Amal A.: *See*—
Johnson, Donavon W.; Shaheen-Gouda, Amal A.; and Smith, Todd A., 5,151,989, Cl. 395-600.000.

Shal, David A.: *See*—
Hoptry, David A.; Petrofes, James M.; Shal, David A.; and Denton, Gary R., 5,150,915, Cl. 280-707.000.
Petrofes, James M.; Shal, David A.; Denton, Gary R.; and Hoptry, David A., 5,150,916, Cl. 280-707.000.

Sham, Hing L.; Norbeck, Daniel W.; Kempf, Dale J.; and Zhao, Chen, to Abbott Laboratories. Retroviral protease inhibiting compounds. 5,151,438, Cl. 514-357.000.

Shambrook, Kevin P.: *See*—
Bakhit, Gabriel G.; and Shambrook, Kevin P., 5,151,388, Cl. 437-209.000.

Shamoto, Sumikazu, to Toyota Jidosha Kabushiki Kaisha. Electric automobile driving apparatus. 5,151,641, Cl. 318-762.000.

Shanley and Baker: *See*—
McKie, R. Thomas, 5,150,844, Cl. 241-73.000.

Shapiro, Leo. Bath chair swivel foot. 5,150,482, Cl. 4-562.100.

Sharp, Brian W.: *See*—
Cook, David C.; Hart, Terance W.; Mc Lay, Iain M.; Palfreyman, Malcolm N.; Sharp, Brian W.; and Walsh, Roger J. A., 5,151,436, Cl. 514-314.000.

Sharp Kabushiki Kaisha: *See*—
Katayama, Mikio; Kato, Hiroaki; Nagayasu, Takayoshi; Imaya, Akihiko; Negoto, Hidenori; Kanemori, Yuzuru; and Hirobe, Toshihiko, 5,151,807, Cl. 359-59.000.
Kida, Shigeru; and Sakai, Katsuyuki, 5,150,630, Cl. 74-354.000.
Koden, Mitsuhiro; Kuratate, Tomoaki; Funada, Fumiaki; Sakaguchi, Kazuhiko; and Kitamura, Tohru, 5,151,214, Cl. 252-299.610.
Koizumi, Satoru, 5,151,834, Cl. 360-92.000.
Kunikawa, Norihide; Yamada, Yoshikado; Mori, Yoshiteru; and Matsuo, Toshihisa, 5,150,890, Cl. 271-9.000.
Nammatsu, Akihiro; Ishii, Mitsuo; and Minezaki, Shigehiro, 5,151,298, Cl. 427-77.000.
Satou, Hiroki; and Horinouchi, Kazuyuki, 5,151,613, Cl. 307-243.000.
Shiraki, Tatsuya; and Kado, Makoto, 5,151,975, Cl. 395-153.000.
Tanaka, Masaru; and Ishii, Yutaka, 5,151,688, Cl. 340-707.000.
Ueda, Toru; Ishizuka, Yasushi; Togawa, Fumio; and Aramaki, Takashi, 5,151,951, Cl. 382-19.000.

Sharpe, David E., to Philip Morris Inc. Scintillation tube dynamic calibration monitor and feedback regulator. 5,151,648, Cl. 323-282.000.

Shaura, Hazime: *See*—
Sato, Mitsuo; Shaura, Hazime; and Tateishi, Megumi, 5,151,276, Cl. 425-110.000.

Sheehan, Timothy G.: *See*—
Crowley, Carmel; Sheehan, Timothy G.; and Ward, Frederick G., 5,151,355, Cl. 435-214.000.

Sheih, Pong S.: *See*—
Treybig, Duane S.; Wang, David S.; Sheih, Pong S.; and Ho, Loan A., 5,151,485, Cl. 528-87.000.

Shekleton, Jack R., to Sundstrand Corporation. Unitized fuel manifold and injector for a turbine engine. 5,150,570, Cl. 60-39.360.

Shell Oil Company: *See*—
Job, Robert C., 5,151,399, Cl. 502-127.000.
Stevens, Craig A.; Gibler, Carma J.; Chamberlain, Linda R.; and Brownscombe, Thomas F., 5,151,475, Cl. 526-83.000.

Shell Research Limited: *See*—
Briner, Paul H., 5,151,550, Cl. 562-468.000.

Shenoi, Kishan; Hanagan, Patrick L.; Ho, Helena S.; and Yu, Frank I., to DSC Communications Corporation. DS1 trunk packing and unpacking apparatus and method. 5,151,901, Cl. 370-110.100.

Shepard, Howard: *See*—
Metlitsky, Boris; Swartz, Jerome; Barkan, Edward; Shepard, Howard; Goren, David; and Biuso, Tony, 5,151,580, Cl. 235-462.000.

Sheppard, Clyde H.: *See*—
Lubowitz, Hyman R.; and Sheppard, Clyde H., 5,151,487, Cl. 528-170.000.

Shibabuchi, Toshio: *See*—
Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, 5,150,922, Cl. 285-21.000.

Shibata, Hiroki: *See*—
Oda, Goichi; Toda, Atsushi; Yagi, Soichi; and Shibata, Hiroki, 5,151,631, Cl. 315-127.000.

Shibata, Junichirou, to Tokyo Electron Limited; and Tokyo Electron Yamanashi Limited. IC sorting and receiving apparatus and method. 5,150,797, Cl. 209-573.000.

Shibata, Junichirou, to Tokyo Electron Limited; and Tokyo Electron Yamanashi Limited. Apparatus for testing IC elements. 5,151,651, Cl. 324-158.00P.

Shibata, Yoshitaka: *See*—
Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, 5,150,489, Cl. 8-159.000.

Shibuya, Yoshiyuki: *See*—
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 5,151,206, Cl. 252-62.510.

Shichijo, Yasuhisa: *See*—
Kumaki, Tuneo; Nagase, Toshikatu; and Shichijo, Yasuhisa, 5,150,649, Cl. 101-365.000.

Shier, Richard K.: *See*—
Rush, William B., II; Elder, Jack E.; and Shier, Richard K., 5,150,669, Cl. 123-52.0MF.

Shigekawa, Naoteru: *See*—
Enoki, Takatomo; Shigekawa, Naoteru; and Arai, Kunihiro, 5,151,757, Cl. 357-22.000.

Shigematsu, Kazuyoshi; Nakagawa, Takashi; and Sakamoto, Shuji, to Idemitsu Kosan Co., Ltd. Dihydric phenols. 5,151,531, Cl. 552-115.000.

Shigeta, Kazuo: *See*—
Nishiyama, Yukio; and Shigeta, Kazuo, 5,151,327, Cl. 428-343.000.

Shigeta, Teruaki: *See*—
Matsuno, Yoshio; Choji, Shinichiro; Ito, Kazuhiko; and Shigeta, Teruaki, 5,151,850, Cl. 362-75.000.

Shih, Edward: *See*—
Sedigh, Mohammad; Shyr, Richard; Shih, Edward; and Mitchell, Muni, 5,151,846, Cl. 361-306.000.

Shikichi, Satoshi; and Nakahara, Takashi, to Canon Kabushiki Kaisha. Optical information processing apparatus in which the output of an optical sensor is replaced by a reference signal during the occurrence of malfunction. 5,151,888, Cl. 369-44.320.

Shimada, Makoto: *See*—
Danno, Yoshiaki; Togai, Kazuhide; Yoshida, Masato; Ueda, Katsunori; and Shimada, Makoto, 5,151,861, Cl. 364-426.020.

Shimadzu Corporation: *See*—
Hirose, Hideo, 5,151,928, Cl. 378-119.000.
Kiri, Motosada; and Adachi, Susumu, 5,151,588, Cl. 250-208.100.

Shimanaka, Shigeki; and Kato, Yuji, to Nissan Motor Co., Ltd. Line pressure arrangement for automotive power train including traction company. 5,150,761, Cl. 180-197.000.

Shimano Industrial Co., Ltd.: *See*—
Noda, Hideo, 5,150,854, Cl. 242-310.000.

Shimizu Construction Co.: *See*—
Yamada, Toshiyuki; Takahama, Yoshihiro; Kurihara, Kazushige; and Nakajima, Hajime, 5,150,556, Cl. 52-639.000.

Shimizu, Hideaki: *See*—
Komuro, Kyozi; Hayakawa, Atsuya; and Shimizu, Hideaki, 5,151,863, Cl. 364-470.000.

Shimizu, Masahiko: *See*—
Morimoto, Kiyoshi; Iwamoto, Akikazu; Shimizu, Masahiko; Miwa, Teiichi; and Murata, Kazue, 5,150,990, Cl. 406-50.000.

Shimizu, Norio: *See*—
Kawaguchi, Hideo; Takeuchi, Kouji; Ishibashi, Tadashi; Shimizu, Norio; and Odawara, Yoji, 5,151,362, Cl. 435-240.250.

Shimizu, Satoshi: *See*—
Kawasaki, Keiichi; Ohkoda, Keiji; Kudo, Tomohiro; and Shimizu, Satoshi, 5,151,713, Cl. 346-108.000.

Shimizu, Tadafumi, to Minolta Camera Kabushiki Kaisha. Sheet feeding apparatus. 5,150,892, Cl. 271-98.000.

Shimizu, Yasuhiko, to Kabushiki Kaisha Toshiba. Wire bonding method and apparatus for same capable of packaging semiconductor device into thin package. 5,150,828, Cl. 228-102.000.

Shimoda, Tomoaki: *See*—
Sakashita, Takeshi; and Shimoda, Tomoaki, 5,151,491, Cl. 528-199.000.

Shimomoto, Yasuharu: *See*—
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.

Shindo, Atsunori: *See*—
Miyahara, Shyoichiro; Suzuki, Maki; Shindo, Atsunori; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, 5,151,359, Cl. 435-226.000.

Shinji, Yasuhisa; Hasegawa, Toshiaki; Akune, Shinichi; and Sakuhara, Hirohiko, to Yazaki Corporation. Electrical connector for shielding cable. 5,151,053, Cl. 439-610.000.

Shinka, Michitoshi: *See*—
Ikeda, Hiroyuki; Shinka, Michitoshi; Tayama, Suehiro; Sawano, Tetuya; and Saruta, Masahiro, 5,151,482, Cl. 526-329.700.

Shinohara, Takayuki: *See*—
Mori, Yoshihide; and Shinohara, Takayuki, 5,151,774, Cl. 357-79.000.

Shinwa Sangyo Co., Ltd.: *See*—
Nakashiba, Akio; Nishimura, Hiroyuki; Nagatani, Fumio; Mito, Kazunori; Shibabuchi, Toshio; and Nakaoka, Mikio, 5,150,922, Cl. 285-21.000.

Shirai, Mitugu: *See*—
Matsui, Kiyoshi; Satoh, Ryohei; Netsu, Toshitada; Sasaki, Hideaki; Shirai, Mitugu; and Hamamura, Kenichi, 5,151,773, Cl. 357-74.000.

Shirakawa, Junji: *See*—
Uno, Kazuo; and Shirakawa, Junji, 5,150,893, Cl. 271-157.000.

Shiraki, Tatsuya; and Kado, Makoto, to Sharp Kabushiki Kaisha. Word processor with text layout display function. 5,151,975, Cl. 395-153.000.

Shire, Michael H., to Quake Industries, Inc. Scope cover. 5,150,528, Cl. 33-244.000.

Shirota, Koromo: *See*—
Fukushima, Kyouko; Shirota, Koromo; and Koike, Shouji, 5,151,128, Cl. 106-20.000.

Shirouzu, Shunji: *See*—
Tanaka, Kuniyoshi; Shirouzu, Shunji; Ohta, Minoru; and Miyagawa, Hideo, 5,151,659, Cl. 324-458.000.

Shiseido Company, Ltd.: *See*—
Takamoto, Ryuichi; Nanba, Ryujiro; Matsuoka, Masahiro; and Sawada, Tsuguo, 5,151,590, Cl. 250-215.000.

Shishido, Kouji: *See*—
Kitahara, Motohide; Ozaki, Hiroshi; and Shishido, Kouji, 5,151,108, Cl. 51-296.000.

Shockley, Thomas H.: *See*—
Zey, Edward G.; Shockley, Thomas H.; Ryan, Debra A.; and Moss, Gary L., 5,151,551, Cl. 562-494.000.

Shoji, Yoshio: *See*—
Akutsu, Eiichi; Shoji, Yoshio; Soga, Hiroo; and Ando, Shigehito, 5,151,719, Cl. 346-160.100.

Shop Vac Corporation: *See*—
Berfield, Robert C., 5,150,499, Cl. 15-327.100.

Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; and Colin, Michel, to Centre International de Recherches Dermatologiques (CIRD). Sulphur-containing eicosanoides and their application in pharmacy and in cosmetics. 5,151,534, Cl. 554-88.000.

Shutoku, Ryuji: *See*—
Takahashi, Kaoru; Tsumuji, Akio; and Shutoku, Ryuji, 5,151,683, Cl. 340-518.000.

Shyr, Richard: *See*—
Sedigh, Mohammad; Shyr, Richard; Shih, Edward; and Mitchell, Muni, 5,151,846, Cl. 361-306.000.

Sibigtroth, James M.: *See*—
Langan, John A.; and Sibigtroth, James M., 5,151,986, Cl. 395-550.000.

Sideman, Samuel: *See*—
Halmann, Menachem; Azhari, Haim; Beyar, Rafael; Sideman, Samuel; and Dinnar, Uri, 5,151,856, Cl. 364-413.030.

Siebert, Edward T., to Hughes Danbury Optical Systems, Inc. Coherent radiation detector. 5,151,585, Cl. 250-201.900.

Siefken, Allen J., to RAJ Industries, Inc. Switch protection circuit. 5,151,840, Cl. 361-13.000.

Siemens Aktiengesellschaft: *See*—
Biehl, Wilfried; and Kleine-Onnibrink, Bernhard, 5,151,675, Cl. 335-78.000.
Boy, Jurgen; and Jacubeit, Matthias, 5,151,630, Cl. 313-602.000.
Grallert, Hans-Joachim, 5,151,902, Cl. 371-51.000.
Hagl, Ernst, 5,151,930, Cl. 379-57.000.
Moschuering, Hugo, 5,151,652, Cl. 324-158.00P.
Mueller, Gustav; and Stoll, Lothar, 5,151,959, Cl. 385-50.000.
Riedle, Ulrich, 5,151,936, Cl. 379-403.000.
Stegherr, Michael; and Pfaffel, Bruno, 5,151,624, Cl. 307-498.000.

Siemens Corporate Research Inc.: *See*—
Petsche, Thomas, 5,151,969, Cl. 395-24.000.

Siemens Energy & Automation, Inc.: *See*—
Morgan, Robert W., 5,151,043, Cl. 439-212.000.

Siemens Nixdorf Informationssystem AG: *See*—
Busch, Peter; Rettenmaier, Helmut; and Sterzik, Willi, 5,151,851, Cl. 363-25.000.

Siemens-Nixdorf Informationssysteme AG: *See*—
Hilkenmeier, Jurgen; and Volke, Hans-Werner, 5,150,976, Cl. 400-124.000.

Sigai, A. Gary, to GTE Products Corporation. Pre-water-based suspension alumina coated phosphor treatment process. 5,151,215, Cl. 252-301.60F.

Sillitto, Hilary G.; and Lessels, Alison B., to GEC Ferranti Defence Systems Limited. Zoom lens. 5,151,820, Cl. 359-354.000.

Silvenis, Scott A.; Monaghan, Paul B.; Massucco, Arthur A.; Spencer, Richard H.; and Gagne, William R., to DowBrands Inc. Liquid spray dispenser. 5,150,841, Cl. 239-332.000.

Silzer, Elmar; and Leung, Emil Y., to Arvan, Inc. Side window air deflector incorporating a side view mirror. 5,150,941, Cl. 296-152.000.

Simeroth, David L.; Brink, David S.; Willis, Reid S.; and Backlund, Dale J., to Dow Chemical Company, The. Fluid sampling for gas chromatograph with modified sampling valve. 5,150,601, Cl. 73-23.410.

SIMES Societa Italiana Medicinali e Sintetici S.p.A.: *See*—
Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, 5,151,414, Cl. 514-114.000.

Simin, Gerald L., to General Motors Corporation. Swing-out tail lamp. 5,150,939, Cl. 296-37.100.

Simon Marketing, Inc.: *See*—
Filo, Andrew S., 5,151,595, Cl. 250-316.100.

Simpson, Edwin K. Package integrity detection method. 5,150,605, Cl. 73-49.300.

Simpson, James L., to Hemox, Inc. Method of manufacturing medical appliance disposal container. 5,151,074, Cl. 493-133.000.

Simpson, Jay R.: *See*—
Krol, Denise M.; and Simpson, Jay R., 5,151,817, Cl. 359-328.000.

Simpson, Stephen J.: *See*—
Quinlan, Roger J., Jr.; and Simpson, Stephen J., 5,150,554, Cl. 52-282.000.

Simpson, Stewart A.; and Dicke, Rock D., to Hydrocarbon Filtration Systems, Inc. Filter for removing liquid hydrocarbons from water and process of removing gaseous and/or hydrocarbons from water. 5,151,194, Cl. 210-680.000.

Simpson Strong-Tie Company, Inc.: *See*—
Commins, Alfred D.; and Romeo, Ernest A., 5,150,553, Cl. 52-264.000.
Gilb, Tyrell T., 5,150,982, Cl. 403-232.100.

Sindelar, Joseph L. Golf putting training device. 5,150,904, Cl. 273-192.000.

Singh, Anand K.: *See—*
Provenzano, Virgil; Singh, Anand K.; Imam, M. A.; Sadananda, Kuntimadi; and Henshaw, William F., 5,151,407, Cl. 505-1.000.

Singh, Devinder; Hardaway, Anthony H.; Euler, John W.; and Pastryk, Jim J., to Whirlpool Corporation. Concentrate wash automatic washer with reciprocating basket. 5,150,588, Cl. 68-23.500.

Sirany, Dallas. Method of treating a papova-type viral infection. 5,151,415, Cl. 514-163.000.

Siskin, Michael: *See—*
Vaughn, Stephen N.; Siskin, Michael; Katritzky, Alan; Brons, Glen; Reynolds, Steve N.; Culross, Claude C.; and Neskora, Dan R., 5,151,173, Cl. 208-430.000.

Sivacoe, Orlande. Pipeline pig. 5,150,493, Cl. 15-104.061.

Skalka, Gerald P., to Recreation Technology, Inc. Playground equipment. 5,151,069, Cl. 482-35.000.

SKC Limited: *See—*
Yoo, Taek J.; Jang, Yong N.; Oh, Wook H.; and Jeong, Chan S., 5,151,186, Cl. 210-541.000.

Skinner, William O., to Press Seal Gasket Corporation. Expandable seal arrangement. 5,150,927, Cl. 285-189.000.

Slattery, William J.: *See—*
Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., 5,151,559, Cl. 174-52.400.

Slife, Jimmy D.; and Farrell, David, to XEL Communications, Inc. Programmable universal signaling circuit for a telephone network. 5,151,935, Cl. 379-240.000.

Sloan Valve Company: *See—*
Whiteside, John F.; and Richardson, Bradley S., 5,150,877, Cl. 251-40.000.

Smejkal, Hellmuth: *See—*
Auer, Johann; Pirklbauer, Wilfried; Ramaseder, Norbert; and Smejkal, Hellmuth, 5,151,243, Cl. 266-78.000.

Smit, Gerrit: *See—*
Haagh, Johannes P. N.; van Driest, Hans; and Smit, Gerrit, 5,151,920, Cl. 375-1.000.

Smith, Alan J.; and Quinn, Jennifer J., to Thames Water Utilities Limited. Fluid treatment. 5,151,197, Cl. 210-758.000.

Smith, Connie M.: *See—*
DeLuca, Hector F.; and Smith, Connie M., 5,151,416, Cl. 514-167.000.

Smith, Douglas D.: *See—*
Hsueh, Paul W.; and Smith, Douglas D., 5,151,879, Cl. 365-190.000.

Smith, Gary A.: *See—*
Farling, Duane J.; and Smith, Gary A., 5,150,533, Cl. 34-62.000.

Smith, Glenn W., to Baltimore Aircoil Company. Head pressure controller for air conditioning and refrigeration systems. 5,150,581, Cl. 62-115.000.

Smith, Hylton H.; Huber, Hans F.; and Muller, Hartmut, to Huls Aktiengesellschaft. Radiation-cured film web and a process for its preparation. 5,151,493, Cl. 528-272.000.

Smith, Kenneth T.: *See—*
Saltman, Paul D.; and Smith, Kenneth T., 5,151,274, Cl. 424-630.000.

Smith, Michael G.; Jacks, Wendy S.; Lo, William C.; and Ehr, Robert J., to DowElanco. Herbicidal 2-(phenoxy or phenylthio)-2-(pyrimidinyloxy or 1,3,5-triazinyloxy)-alkanoic acids. 5,151,113, Cl. 71-92.000.

Smith, Sherman: *See—*
Spiegel, Si; and Smith, Sherman, 5,150,874, Cl. 248-514.000.

Smith, Stanley E.: *See—*
Hamberg, James P.; Baldini, Todd H.; Smith, Stanley E.; Collins, Wendell, Jr.; and Longhouse, Richard E., 5,150,886, Cl. 267-220.000.

Smith, Thane, to Comasat. Planar-doped valley field effect transistor (PDVFET). 5,151,758, Cl. 357-22.000.

Smith, Todd A.: *See—*
Johnson, Donavon W.; Shaheen-Gouda, Amal A.; and Smith, Todd A., 5,151,989, Cl. 395-600.000.

Smiths Industries Public Limited Company: *See—*
Fox, Neil A., 5,150,965, Cl. 362-260.000.

Snead, Wilford A., to Minnesota Mining and Manufacturing Company. Triple passage orthodontic buccal tube. 5,151,028, Cl. 433-17.000.

Snyder, Dane T.: *See—*
Law, Robert J.; Robles, Michel N.; and Snyder, Dane T., 5,151,244, Cl. 376-245.000.

Snyder, Lawrence; and Konstantinidou, Smaragda, to Washington Research Foundation. Chaos router system. 5,151,900, Cl. 370-94.300.

Societa' Cavi Pirelli S.p.A.: *See—*
Boero, Paolo; and Bortolin, Bruno, 5,150,516, Cl. 29-877.000.

S.A. Copel Industrie: *See—*
Schoutteten, Bruno, 5,151,319, Cl. 428-257.000.

Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle: *See—*
Gaide, Pierre, 5,150,856, Cl. 244-3.200.
Valy, Yves H. G.; Coquet, Pascal D.; and Amagat, Michel, 5,150,741, Cl. 141-18.000.

Societe Nationale Industrielle et Aerospatiale: *See—*
Azzara, Sauveur A.; and Coutant, Herve G. F., 5,151,236, Cl. 264-257.000.

Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, to Sumitomo Rubber Industries, Ltd.; and Mitsubishi Jukogyo Kabushiki Kaisha. Method for vulcanizing elastomer products and apparatus therefor. 5,151,242, Cl. 264-572.000.

Soffer, Bernard H.: *See—*
Grinberg, Jan; O'Meara, Thomas R.; Owechko, Yuri; Pedinoff, Melvin E.; and Soffer, Bernard H., 5,151,814, Cl. 359-209.000.

Soga, Hiroo: *See—*
Akutsu, Eiichi; Shoji, Yoshio; Soga, Hiroo; and Ando, Shigehito, 5,151,719, Cl. 346-160.100.

Solcia, Carolina; and Succi, Marco, to SAES Getters SpA. Gas purifier having end of life detector. 5,151,251, Cl. 422-119.000.

Solomon, Donald D.: *See—*
Lambert, James M.; and Solomon, Donald D., 5,151,231, Cl. 264-108.000.

Somar Corporation: *See—*
Hamamura, Fumio; and Watanabe, Katsuyoshi, 5,150,639, Cl. 83-39.000.

Somfy: *See—*
Giust, Henri; and Cippelletti, Ennio, 5,150,846, Cl. 242-54.00R.

Sony Corporation: *See—*
Nagasawa, Tsuyoshi, 5,151,832, Cl. 360-85.000.
Nishiguchi, Masayuki; Fujiwara, Yoshihito; and Umezawa, Tomoko, 5,151,941, Cl. 381-46.000.
Sakata, Matsumi; Kumura, Tatsuo; Suzuki, Atsushi; Ikeda, Yoshito; Aoki, Kaoru; Kojima, Naoto; and Mishima, Akio, 5,150,511, Cl. 29-603.000.
Tamamura, Koushi; and Iwamoto, Hiroyuki, 5,151,912, Cl. 372-46.000.
Yamamoto, Masanobu; and Itoh, Kazumine, 5,151,813, Cl. 359-202.000.
Yokono, Shigeru; and Tobita, Minoru, 5,151,905, Cl. 371-39.100.
Yoshikawa, Takao; and Masuda, Isao, 5,151,792, Cl. 358-327.000.

Sony Magnescale Inc.: *See—*
Okubo, Hiroyuki, 5,151,798, Cl. 359-1.000.

Sorola, Bret S. Swivel construction. 5,150,539, Cl. 43-43.100.

Soubrie, Philippe: *See—*
Garcia, Georges; Di Malta, Alain; and Soubrie, Philippe, 5,151,442, Cl. 514-456.000.

Souliere, Joseph M.: *See—*
Veltri, Jeffrey A.; and Souliere, Joseph M., 5,151,678, Cl. 340-321.000.

Sounik, David F.: *See—*
Harasin, Stephen J.; Sounik, David F.; and Kelly, Timothy J., 5,151,483, Cl. 528-44.000.

Southco, Inc.: *See—*
Bisbing, Robert H., 5,150,500, Cl. 16-239.000.

Southern Mills, Inc.: *See—*
Statham, Denise N.; Stanhope, Michael T.; and Hejhal, Thomas J., 5,150,476, Cl. 2-93.000.

Southwest Research Institute: *See—*
Rollwitz, William L.; De Los Santos, Armando; Perry, William D.; Burrahm, Robert W.; and Davis, James K., 5,151,695, Cl. 340-870.330.

Souza, Lawrence M.; and Boone, Thomas C., to Amgen Inc. DNA encoding avian growth hormones. 5,151,511, Cl. 536-27.000.

Souza, Robert J.: *See—*
Thomas, Robert E.; Varghese, George; Souza, Robert J.; and Harvey, George A., 5,151,899, Cl. 370-94.100.

SpaceLabs, Inc.: *See—*
Brooks, Robert J., 5,150,708, Cl. 128-419.00D.

Spadaccini, Louis J.; Marteney, Pierre J.; and Colket, Meredith B., III, to United Technologies Corporation. Method of cooling with an endothermic fuel. 5,151,171, Cl. 208-48.00Q.

Spears, Steven A.: *See—*
Walker, David L.; and Spears, Steven A., 5,150,957, Cl. 358-347.000.

Spencer, Richard H.: *See—*
Silvenis, Scott A.; Monaghan, Paul B.; Massucco, Arthur A.; Spencer, Richard H.; and Gagne, William R., 5,150,841, Cl. 239-332.000.

Spicer, Warren R.: *See—*
Spicer, William W.; and Spicer, Warren R., 5,151,685, Cl. 340-605.000.

Spicer, William W.; and Spicer, Warren R. Water level alarm apparatus. 5,151,685, Cl. 340-605.000.

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Spigner, Kenneth W. Can collection apparatus. 5,151,005, Cl. 414-437.000.

Spinner, Charles R., III, to SGS-Thomson Microelectronics, Inc. Method of making polycrystalline silicon resistors for integrated circuits. 5,151,376, Cl. 437-47.000.

Spitz, Roger; Malinge, Jean; and Joly, Jean-Francois, to Atochem. Process for the polymerization of ethylene and catalytic component therefor. 5,151,396, Cl. 502-104.000.

Spoonmore, Robert T.: *See—*
Bandy, Michael J.; Byerly, Roy H.; and Spoonmore, Robert T., 5,150,735, Cl. 137-614.060.

Sprenger, Kurt: *See—*
Nothdurft, Heinz; Trunk, Reinhard; Sprenger, Kurt; and Alvarez-Avila, Carlos, 5,150,688, Cl. 123-506.000.

Spring, David J.: *See—*
Mitchell, Mark D.; and Spring, David J., 5,150,577, Cl. 62-18.000.

Springer, Helmut: *See—*
Lappe, Peter; and Springer, Helmut, 5,151,537, Cl. 556-136.000.

Square D Company: *See*—
Bronikowski, Joseph T.; Hill, Brian T.; Sackmann, David J.; and Weber, Mark S., 5,151,978, Cl. 395-200.000.
SRI International: *See*—
Green, Philip S., 5,150,714, Cl. 128-660.060.
Staff GmbH & Co. KG: *See*—
Range, Helmut; and Beigel, Gerhard, 5,151,037, Cl. 439-110.000.
Range, Helmut; Beigel, Gerhard; Lotsch, Friedemann; and Debie, Peter, 5,151,038, Cl. 439-122.000.
Stahl, Daniel E.: *See*—
Scholz, James P.; and Stahl, Daniel E., 5,151,050, Cl. 439-456.000.
Stammberger, Willi: *See*—
Fulbreth, Werner; Leeb, Richard; Radau, Manfred; and Stammberger, Willi, 5,151,433, Cl. 514-299.000.
Stamper, Christopher T. J.: *See*—
Hochberg, Joel; Stamper, Timothy D. J.; and Stamper, Christopher T. J., 5,150,898, Cl. 273-85.00C.
Stamper, Timothy D. J.: *See*—
Hochberg, Joel; Stamper, Timothy D. J.; and Stamper, Christopher T. J., 5,150,898, Cl. 273-85.00C.
Standard Products Company, The: *See*—
Jackson, Norman C., 5,151,307, Cl. 428-31.000.
Stanhope, Michael T.: *See*—
Statham, Denise N.; Stanhope, Michael T.; and Hejhal, Thomas J., 5,150,476, Cl. 2-93.000.
Stanton plc: *See*—
Greatorex, Cyril B., 5,150,929, Cl. 285-231.000.
Stark, Catherine. Umbrella with magnetic fasteners. 5,150,728, Cl. 135-16.000.
Starr, Stephen G.: *See*—
Conru, H. Ward; Irish, Gary H.; Pakulski, Francis J.; Slattery, William J.; Starr, Stephen G.; and Ward, William C., 5,151,559, Cl. 174-52.400.
Statham, Denise N.; Stanhope, Michael T.; and Hejhal, Thomas J., to Southern Mills, Inc. Insulating fabric and method of producing same. 5,150,476, Cl. 2-93.000.
Stauffer, Harold F., Jr.: *See*—
Taylor, Chandler R., Jr.; Cale, Albert D., Jr.; Johnson, David N.; and Stauffer, Harold F., Jr., 5,151,418, Cl. 514-210.000.
Stawicki, Raymond J. Golf swing training device. 5,150,901, Cl. 273-186.200.
Stec, Wojciech J.; Uznanski, Bogdan; Bergot, B. John; Hirschbein, Bernard L.; and Fearon, Karen L., to Applied Biosystems, Inc. Method of synethesizing sulfurized oligonucleotide analogs. 5,151,510, Cl. 536-27.000.
Stegeman, Aaron H.; and Bechler, Ronald F., to Ranger All Season Corp. Personal mobility vehicle. 5,150,762, Cl. 180-208.000.
Stegherr, Michael; and Pfaffel, Bruno, to Siemens Aktiengesellschaft. Multiplier circuit. 5,151,624, Cl. 307-498.000.
Steimel, James M.: *See*—
Kaczmarek, James S.; and Steimel, James M., 5,150,624, Cl. 73-865.900.
Stein, Stuart D.: *See*—
McCullough, Francis P., Jr.; and Stein, Stuart D., 5,151,198, Cl. 210-767.000.
Steinberg, Nathan G.; Rasmusson, Gary H.; and Salzmann, Thomas N., to Merck & Co., Inc. Specific 17β-thiobenzoyl-4-aza-5α-androst-1-en-3-ones as antiandrogen agents. 5,151,430, Cl. 514-284.000.
Steinemann, Werner: *See*—
Gernet, Pierre; Steinemann, Werner; and Margot, Paul-Andre, 5,151,677, Cl. 338-99.000.
Steiner, Manfred: *See*—
Leiber, Heinz; Steiner, Manfred; and Klinkner, Walter, 5,150,951, Cl. 303-100.000.
Stengel, Robert E.: *See*—
Balzano, Quirino; and Stengel, Robert E., 5,151,709, Cl. 343-741.000.
Stenmans, Heinz, to Palitex Project Company GmbH. Thread processing machine spindle assembly having mechanical adjustment mechanisms for devices within a rotating thread balloon. 5,150,566, Cl. 57-58.830.
Stephansky, John J.; and Sutton, John P., to Dresser Industries, Inc. High aluminia tar-impregnated pressure pouring tubes. 5,151,200, Cl. 222-590.000.
Stephens, Richard B., to General Atomics. Barrier for scattering electromagnetic radiation. 5,151,819, Cl. 359-350.000.
Sterzik, Willi: *See*—
Busch, Peter; Rettenmaier, Helmut; and Sterzik, Willi, 5,151,851, Cl. 363-25.000.
Steuri, Christian; and Williams, Theresa B., to Procter & Gambie Company, The. Shampoo compositions. 5,151,210, Cl. 252-174.017.
Stevens, Craig A.; Gibler, Carma J.; Chamberlain, Linda R.; and Brownscombe, Thomas F., to Shell Oil Company. Termination of anionic polymerization. 5,151,475, Cl. 526-83.000.
Stevens, William: *See*—
Greenwald, C. Kent; Gray, Leslie M.; Read, R. Bart; and Stevens, William, 5,151,014, Cl. 416-237.000.
Stewart, Bryan J.; and Stewart, Victoria J. Wax applicator with rubber bumper end. 5,150,978, Cl. 401-14.000.
Stewart, Victoria J.: *See*—
Stewart, Bryan J.; and Stewart, Victoria J., 5,150,978, Cl. 401-14.000.
Stewen, Wilhelm: *See*—
Wessiepe, Klaus; and Stewen, Wilhelm, 5,150,543, Cl. 49-477.000.
Stiles, Steven D.: *See*—
Trombley, Douglass E.; Stiles, Steven D.; Buslepp, Kenneth J.; and Buslepp, Kenneth J., 5,150,692, Cl. 123-533.000.
Stinson, Randy L. Apparatus and method for irradiating cells. 5,150,705, Cl. 128-396.000.
Stocko Metallwarenfabriken Henkels und Sohn GmbH & Co.: *See*—
Rautenberg, Paul-Georg, 5,151,847, Cl. 361-395.000.
Stoll, James R.: *See*—
Foehse, Karen B.; Efstathiou, John D.; and Stoll, James R., 5,151,283, Cl. 426-93.000.
Stoll, Lothar: *See*—
Mueller, Gustav; and Stoll, Lothar, 5,151,959, Cl. 385-50.000.
Stoltman, Donald D.: *See*—
Kabasin, Daniel F.; and Stoltman, Donald D., 5,150,696, Cl. 123-571.000.
Stommels, Franciscus J.: *See*—
Verhulst, Antonius G. H.; Hartmann, Wilbert J. A. M.; Stommels, Franciscus J.; and Luyckx-Smolders, Ann M. M., 5,151,804, Cl. 359-56.000.
Stone & Webster Engineering Corporation: *See*—
Bowen, Colin P.; and Brewer, John R., 5,151,158, Cl. 196-110.000.
Stoner, David J.; Sanger, Joseph M.; Pahoundis, Louis E.; and Riahi, James H., to Reed Manufacturing. Particulate-material gun with improved sealing system. 5,150,991, Cl. 406-67.000.
Stork, Harry R.: *See*—
Wetzel, Charles M.; Ritt, Peter M.; Roberts, Owen H., Jr.; and Stork, Harry R., 5,151,337, Cl. 430-28.000.
Storopack Hans Reichenecker GmbH & Co.: *See*—
Busch, Waldemar; and Lutz, Norbert, 5,150,490, Cl. 12-146.00M.
Stossel, Richard: *See*—
Strasilla, Dieter; Stossel, Richard; Mulhaupt, Rolf; and Kreibich, Ursula, 5,151,318, Cl. 428-246.000.
Stout, Douglas W.: *See*—
Austin, John S.; Piro, Ronald A.; and Stout, Douglas W., 5,151,619, Cl. 307-473.000.
Strand, Olaf, to Norsk Hydro A.S. Manufacturing method for a flexible container. 5,151,076, Cl. 493-186.000.
Strang, Harry: *See*—
Muller, Klaus-Helmut; Kirsten, Rolf; Kluth, Joachim; Konig, Klaus; Riebel, Hans-Jochem; Babczinski, Peter; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,151,514, Cl. 544-212.000.
Strasilla, Dieter; Stossel, Richard; Mulhaupt, Rolf; and Kreibich, Ursula, to Ciba-Geigy Corporation. Reinforcing material. 5,151,318, Cl. 428-246.000.
Strasser, Alexander; Martens, Feodor B.; Dohmen, Jurgen; and Hollenberg, Cornelius P., to Hollenberg, Cornelius. Fermentation processes using amylolytic enzyme producing microorganisms. 5,151,354, Cl. 435-161.000.
Straumann, Fritz: *See*—
Tepic, Slobodan; Perren, Stephen; Straumann, Fritz; and Sutter, Franz, 5,151,103, Cl. 606-69.000.
Strid, Kent; Karlsson, Hans A.; and Larsson, Per. Filter for continuous filtration. 5,151,176, Cl. 210-178.000.
Strom, E. Thomas: *See*—
Phelps, Craig H.; and Strom, E. Thomas, 5,150,754, Cl. 166-294.000.
Strong, Kathleen M.; and Matusewicz, Richard S., to Beckman Instruments, Inc. Diagnostic specimen mailing device. 5,150,971, Cl. 383-84.000.
Strong, Molly. Winter weather footwear article. 5,150,536, Cl. 36-7.10R.
Strong, Russell C.: *See*—
Majestic, Veronica K.; and Strong, Russell C., 5,151,220, Cl. 252-392.000.
Struglinski, Mark J., to Exxon Chemical Patents Inc. Oleaginous compositions containing novel ethylene alpha-olefin polymer viscosity index improver additive. 5,151,204, Cl. 252-52.00R.
Stutzle, Siegfried: *See*—
Mann, Egon; Eymuller, Helmut; and Stutzle, Siegfried, 5,151,068, Cl. 475-322.000.
Succi, Marco; and Doni, Fabrizio, to SAES Getters SpA. Method for determining the end of useful life of an inert gas purifier and apparatus therefore. 5,150,604, Cl. 73-38.000.
Succi, Marco: *See*—
Solcia, Carolina; and Succi, Marco, 5,151,251, Cl. 422-119.000.
Suda, Yasuo: *See*—
Tokunaga, Tatsuyuki; Aoyama, Keisuke; Fukahori, Hidehiko; Suda, Yasuo; and Akashi, Akira, 5,151,583, Cl. 250-201.200.
Suematsu, Noriharu; Takagi, Tadashi; and Urasaki, Shuji, to Mitsubishi Denki Kabushiki Kaisha. Low-distortion radio-frequency amplifying apparatus. 5,151,664, Cl. 330-149.000.
Suetsugu, Toshio: *See*—
Yamasaki, Yukihiro; Suetsugu, Toshio; Matsuo, Tamotsu; and Okamura, Hideo, 5,151,893, Cl. 369-116.000.
Suga, Seiji, to Atsugi Unisia Corporation. Intake- and/or exhaust-valve timing control system for internal combustion engine. 5,150,671, Cl. 123-90.170.
Suganami, Hideki: *See*—
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

Sugano, Michihiro: *See—*
Sato, Aiya; Sugano, Michihiro; Furuya, Kouhei; Oshima, Takeshi; Kuwano, Harumitsu; Hata, Tadashi; and Haruyama, Hideyuki, 5,151,529, Cl. 549-354.000.

Sugii, Takesi: *See—*
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Sugimura, Naomi, to Murakami Kaimeido Co., Ltd. Inside rear view mirror for a vehicle. 5,151,828, Cl. 359-871.000.

Sugimura, Tohru: *See—*
Araki, Yozo; Ito, Isamu; Sugimura, Tohru; Suzuki, Migaku; and Ochi, Mitsuzo, 5,150,562, Cl. 53-438.000.

Suginoya, Mitsuru; Kamamori, Hitoshi; and Fukuchi, Takakazu, to Seiko Instruments Inc. Method for manufacturing a color filter. 5,151,379, Cl. 427-39.000.

Sugita, Koichi, to Kabushiki Kaisha Top. Combination container and pump having a conical piston for venting. 5,150,823, Cl. 222-386.000.

Sugiyama, Genroku: *See—*
Hirata, Toichi; Tanaka, Hideaki; Sugiyama, Genroku; and Kajita, Yusuke, 5,150,574, Cl. 60-465.000.

Sugiyama, Isao: *See—*
Sasho, Manabu; Yamauchi, Hiroshi; Yamanaka, Motosuke; Nakamura, Takaharu; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; and Negi, Shigeto, 5,151,417, Cl. 514-202.000.

Sugiyama, Yoshiaki: *See—*
Iwashita, Tomonori; Egawa, Akira; and Sugiyama, Yoshiaki, 5,151,726, Cl. 354-75.000.

Suh, Young S., to Samsung Electronics Co., Ltd. Microwave cooker having a rotary stirrer and a rotary food support. 5,151,569, Cl. 219-10.55F.

Sullivan, James J.: *See—*
Quimby, Bruce D.; and Sullivan, James J., 5,151,371, Cl. 436-127.000.

Sumitomo Chemical Co., Ltd.: *See—*
Kurimoto, Isao; and Minai, Masayoshi, 5,151,542, Cl. 558-277.000.
Sato, Hiroshi; and Yoshioka, Hiroshi, 5,151,547, Cl. 560-205.000.

Sumitomo Electric Industries, Ltd.: *See—*
Osawa, Masahiko, 5,151,628, Cl. 313-499.000.
Sawada, Kazuo; Okura, Kengo; Yoshida, Noriyuki; Takano, Satoshi; Miyazaki, Kenji; and Hayashi, Noriki, 5,151,406, Cl. 505-1.000.
Tanaka, Saburo; Nakanishi, Hidenori; and Itozaki, Hideo, 5,151,408, Cl. 505-1.000.

Sumitomo Heavy Industries, Ltd.: *See—*
Washio, Masakazu; and Kawanishi, Syun-ichi, 5,151,486, Cl. 528-124.000.

Sumitomo Rubber Industries, Ltd.: *See—*
Hayashi, Nobuharu; and Tanaka, Hiroji, 5,150,744, Cl. 114-230.000.
Soeda, Koji; Kubota, Yoshiya; Okamoto, Shoji; Kubota, Akinori; Kobayashi, Michihito; Ijiri, Masaaki; Irie, Nobuhiko; Hasegawa, Akira; Katayama, Hideaki; Murakami, Toshifumi; and Sakaguchi, Katsuyoshi, 5,151,242, Cl. 264-572.000.
Takada, Yoshiyuki, 5,151,139, Cl. 152-454.000.

Sun, Xianyi: *See—*
Lee, George C.; and Sun, Xianyi, 5,151,945, Cl. 382-1.000.

Sunaoka, Yoshio; Kitazato, Keisuke; and Tsuda, Satoru, to Japan Organo Co., Ltd. Filtration process using hollow fiber membrane module. 5,151,191, Cl. 210-644.000.

Sundstrand Corporation: *See—*
Ransick, Thomas F., 5,150,859, Cl. 244-58.000.
Shekleton, Jack R., 5,150,570, Cl. 60-39.360.
White, Robert C., 5,150,568, Cl. 60-39.310.

Sung, Chien-Min: *See—*
Cho, Hyun S.; Sung, Chien-Min; Merrill, Leo; and Chen, Sy-Hwa, 5,151,107, Cl. 51-295.000.

Suntory Limited: *See—*
Tanaka, Shoji; Tsujimoto, Masafumi; Wada, Yayoi; Tsuruoka, Nobuo; and Nakazato, Hiroshi, 5,151,349, Cl. 435-69.100.

Suroff, Leonard W. Ultrasonic toothbrush. 5,150,492, Cl. 15-22.100.

Suson, Jolinda K.: *See—*
Burkhalter, John; and Suson, Jolinda K., 5,151,131, Cl. 106-822.000.

Sutter, Franz: *See—*
Tepic, Slobodan; Perren, Stephen; Straumann, Fritz; and Sutter, Franz, 5,151,103, Cl. 606-69.000.

Sutton, Christopher K.: *See—*
Lorenz, Alan S.; and Sutton, Christopher K., 5,151,972, Cl. 379-93.000.

Sutton, John P.: *See—*
Stephansky, John J.; and Sutton, John P., 5,151,200, Cl. 222-590.000.

Suwabe, Shigekazu: *See—*
Yoshizawa, Yoshihito; Bizen, Yoshio; Yamauchi, Kiyotaka; Nishiyama, Toshikazu; and Suwabe, Shigekazu, 5,151,137, Cl. 148-313.000.

Suzue, Masayoshi: *See—*
Yuki, Syoji; Tokui, Yasuyuki; Nishiuchi, Kihachiro; Wada, Kenichi; Suzue, Masayoshi; and Morimoto, Takuo, 5,150,905, Cl. 273-218.000.

Suzuka, Takashi: *See—*
Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, 5,151,696, Cl. 341-22.000.

Suzuki, Aimi; Azuma, Toshiaki; Kimura, Shigeaki; and Hosogi, Yasuyuki, to Ricoh Company, Ltd. Thermosensitive recording paper. 5,151,404, Cl. 503-200.000.

Suzuki, Akira; Norizuki, Takayuki; and Yamanashi, Yasuhiro, to Tomoegawa Paper Co., Ltd. Thermal printing medium, and label and tag incorporating the same. 5,151,403, Cl. 503-200.000.

Suzuki, Atsushi: *See—*
Sakata, Matsumi; Kumura, Tatsuo; Suzuki, Atsushi; Ikeda, Yoshito; Aoki, Kaoru; Kojima, Naoto; and Mishima, Akio, 5,150,511, Cl. 29-603.000.

Suzuki, Hideo; Matsushima, Shunichi; Masubuchi, Takamichi; Obata, Masahiko; and Sakama, Masao, to Yamaha Corporation. Musical tone control apparatus employing palmar member. 5,151,553, Cl. 84-600.000.

Suzuki, Hideo, to Fujitsu Limited. Inter-LAN connection apparatus and inter-LAN connection method. 5,151,897, Cl. 370-85.130.

Suzuki, Hiroshi: *See—*
Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, 5,151,696, Cl. 341-22.000.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See—*
Arai, Hideki; Kawai, Makoto; and Miyai, Kenji, 5,151,254, Cl. 422-180.000.

Suzuki, Kiyomi; and Chijiiwa, Masaru, to Pioneer Electronic Corporation. Method and apparatus for correcting the output of an onboard vehicle terrestrial magnetism sensor. 5,151,872, Cl. 364-571.050.

Suzuki, Maki: *See—*
Miyahara, Shyoichiro; Suzuki, Maki; Shindo, Atsunori; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, 5,151,359, Cl. 435-226.000.

Suzuki, Masaki: *See—*
Ishida, Toshimichi; and Suzuki, Masaki, 5,151,008, Cl. 414-744.500.

Suzuki, Migaku: *See—*
Araki, Yozo; Ito, Isamu; Sugimura, Tohru; Suzuki, Migaku; and Ochi, Mitsuzo, 5,150,562, Cl. 53-438.000.

Suzuki, Shohei; and Sakuma, Isao, to Kabushiki Kaisha Toshiba. Data processing system. 5,151,982, Cl. 395-425.000.

Suzuki, Shoichi: *See—*
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

Suzuki, Tadashi: *See—*
Aoki, Hiroyuki; Suzuki, Tadashi; Katahata, Toshio; Haino, Mutsuo; Nishimura, Genshiro; Kaya, Hiroshi; Tamura, Kozaburo; and Isoda, Takeshi, 5,151,390, Cl. 501-95.000.

Suzuki, Takanori: *See—*
Mukai, Toshio; Yamashita, Yoshiro; and Suzuki, Takanori, 5,151,528, Cl. 549-31.000.

Suzuki, Tatsuyuki: *See—*
Kawaguchi, Akira; Suzuki, Tatsuyuki; and Yoshida, Michihito, 5,151,001, Cl. 414-225.000.

Suzuki, Yasutoshi; Awano, Namoi; Hoshino, Kouichi; and Inuzuka, Hajime, to Nippondenso Co., Ltd. Semiconductor device. 5,151,764, Cl. 357-27.000.

Svedala Industries, Inc.: *See—*
Lobb, Ernest W.; Robbins, Bruce A.; and Depew, David L., 5,150,656, Cl. 104-162.000.

Svyatsky, Eduard M.; Paroubek, George; and Hegland, Frederick P., to Bell & Howell Company. Shingle device for use in multi-pass sorting machine. 5,150,891, Cl. 271-35.000.

Swanson, Roger M.: *See—*
Durland, Scott C.; Cassano, James R.; Dastin, Richard M.; and Swanson, Roger M., 5,151,745, Cl. 355-313.000.

Swapp, Mavin C.: *See—*
Frisbie, Milo W.; Nickerson, Larry A.; and Swapp, Mavin C., 5,151,650, Cl. 324-158.00F.

Swars, Helmut: *See—*
Maus, Wolfgang; and Swars, Helmut, 5,150,573, Cl. 60-299.000.

Swartz, Henry D., to Entwistle Corporation, The. Apparatus for bonding or melt fusing plastic and plastic matrix composite materials. 5,151,149, Cl. 156-379.800.

Swartz, Jerome: *See—*
Metlitsky, Boris; Swartz, Jerome; Barkan, Edward; Shepard, Howard; Goren, David; and Biuso, Tony, 5,151,580, Cl. 235-462.000.

Sylva, Frank W.: *See—*
Bottari, Frank J.; Hanoka, Jack; and Sylva, Frank W., 5,151,386, Cl. 437-187.000.

Symbol Technologies, Inc.: *See—*
Krichever, Mark; and Metlitsky, Boris, 5,151,581, Cl. 235-467.000.
Metlitsky, Boris; Swartz, Jerome; Barkan, Edward; Shepard, Howard; Goren, David; and Biuso, Tony, 5,151,580, Cl. 235-462.000.

Synermed, Inc.: *See—*
Denney, Jerry W., 5,151,370, Cl. 436-74.000.

Synthes (U.S.A.): *See—*
Tepic, Slobodan; Perren, Stephen; Straumann, Fritz; and Sutter, Franz, 5,151,103, Cl. 606-69.000.

Systems Control, Inc.: *See—*
Krzywicki, Stanley J.; Gibson, Timothy S.; and Orndorff, Joseph D., 5,151,654, Cl. 324-160.000.

Szabo, Georges; Schasfoort, Egbertus F. P.; and Milan, Alain, to Compagnie de Raffinage et de Distribution Total France. Process for the activation of halogenated catalysts and catalysts obtained by said process for utilization in hydrocarbon conversion processes. 5,151,400, Cl. 502-203.000.

Tacchetto, Maurizio; Zorzi, Claudio; De Bortoli, Giuseppe; Pozzobon, Alessandro; and Serafin, Renato, to Nordica S.p.A. Securing and adjuster device, particularly for ski boots. 5,150,537, Cl. 36-50.500.

Tada, Shoichiro: *See—*
Matsuzawa, Akira; Kanoh, Masaaki; and Tada, Shoichiro, 5,151,700, Cl. 341-156.000.

Tadros, Sobhy, to OCG Microelectronic Materials, Inc. Selected photoactive methylolated cyclohexanol compounds and their use in radiation-sensitive mixtures. 5,151,340, Cl. 430-192.000.

Tagawa, Kenichi: *See*—
Asano, Koin; Tagawa, Kenichi; Nakagawa, Hiroshi; and Wakahara, Hiroyuki, 5,151,240, Cl. 264-284.000.

Tagawa, Yoichi: *See*—
Murakami, Koichi; Matsuo, Kazuhiro; Iizumi, Kenichi; and Tagawa, Yoichi, 5,150,998, Cl. 412-14.000.

Taguchi, Keiichi, to Mita Industrial Co., Ltd. Sorter for stapling. 5,150,889, Cl. 270-53.000.

Taguchi, Minoru, to Harada Industry Co., Ltd. Automobile antenna and method of manufacturing the same. 5,151,711, Cl. 343-715.000.

Tahara, Hideo; and Makihara, Nobuo, to Nissan Motor Co., Ltd. Supporting device for outboard motor. 5,151,058, Cl. 440-61.000.

Taiwan Fu Hsing Industry Co., Ltd.: *See*—
Lin, Jui C., 5,150,592, Cl. 70-190.000.

Tajiri, Akira. Multifocal contact lens. 5,151,723, Cl. 351-161.000.

Takada, Kazuaki; Kanari, Masayuki; Yajima, Makoto; and Toyoda, Eiji, to Hitachi, Ltd.; and Hitachi Taga Engineering Co., Ltd. Deceleration apparatus for motor and drive circuit for use in motor deceleration apparatus or control apparatus for use in sewing machine. 5,151,637, Cl. 318-376.000.

Takada, Yoshiyuki, to Sumitomo Rubber Industries, Ltd. Heavy duty radial tire having durable buttress portion. 5,151,139, Cl. 152-454.000.

Takagi, Makoto, to Yokohama Rubber Co., Ltd., The. Heavy-duty pneumatic radial tire. 5,151,140, Cl. 152-543.000.

Takagi, Tadashi: *See*—
Suematsu, Noriharu; Takagi, Tadashi; and Urasaki, Shuji, 5,151,664, Cl. 330-149.000.

Takagi, Yukio: *See*—
Ishiguro, Masaaki; Tanaka, Toshizumi; and Takagi, Yukio, 5,150,715, Cl. 128-662.060.

Takahama, Yoshihiro: *See*—
Yamada, Toshiyuki; Takahama, Yoshihiro; Kurihara, Kazushige; and Nakajima, Hajime, 5,150,556, Cl. 52-639.000.

Takahashi, Kaoru; Tsumuji, Akio; and Shutoku, Ryuji, to Nohmi Bosai Co., Ltd. Power supply control device in fire alarm system. 5,151,683, Cl. 340-518.000.

Takahashi, Toshihiro: *See*—
Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, 5,150,489, Cl. 8-159.000.

Takahashi, Yasushi; Matsuura, Hiromi; Koyama, Yoshihisa; Muranaka, Masaya; Kimura, Katsutaka; Miyazawa, Kazuyuki; Ishihara, Masamichi; and Iwai, Hidetoshi, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Semiconductor integrated circuit device. 5,151,772, Cl. 357-71.000.

Takahata, Toshiya: *See*—
Kakutani, Toshiaki; Yanase, Nobuyuki; Fukushima, Hitoshi; and Takahata, Toshiya, 5,151,741, Cl. 355-257.000.

Takai, Kazuhito; and Kimura, Yukihiro, to NEC Corporation. Device capable of modifying a character according to a selected attribute code. 5,151,954, Cl. 382-41.000.

Takaishi, Kazuhiko: *See*—
Hasegawa, Susumi; Mizoshita, Yoshifumi; and Takaishi, Kazuhiko, 5,151,639, Cl. 318-568.180.

Takaku, Masato: *See*—
Ishida, Yuzuru; Inoue, Haruo; Otsuka, Ichiro; Takaku, Masato; Mitsuboshi, Masahiro; Iio, Keiji; and Hashimoto, Atsushi, 5,151,457, Cl. 524-157.000.

Takamaru, Kiyomi: *See*—
Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, 5,150,489, Cl. 8-159.000.

Takamoto, Ryuichi; Nanba, Ryujiro; Matsuoka, Masahiro; and Sawada, Tsuguo, to Shiseido Company, Ltd. Photoacoustic cell and photoacoustic measuring device. 5,151,590, Cl. 250-215.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; and Uchiyama, Yuji, to Victor Company of Japan, Ltd. Method of recording color image information. 5,151,781, Cl. 358-45.000.

Takano, Satoshi: *See*—
Sawada, Kazuo; Okura, Kengo; Yoshida, Noriyuki; Takano, Satoshi; Miyazaki, Kenji; and Hayashi, Noriki, 5,151,406, Cl. 505-1.000.

Takashima, Junko: *See*—
Morita, Yoshiharu; Chaki, Haruyuki; Hoshide, Yasuo; and Takashima, Junko, 5,151,521, Cl. 548-112.000.

Takasugi, Shinji: *See*—
Muramatsu, Shigeki; Takasugi, Shinji; and Osato, Kazumi, 5,151,658, Cl. 324-346.000.

Takatori, Naoki; and Orimoto, Masaaki, to Fuji Photo Film Co., Ltd. Image pickup device for stabilizing optical aberrations. 5,151,790, Cl. 358-225.000.

Takayama, Shinji: *See*—
Hirao, Akihiko; Sawada, Tomoyuki; Takayama, Shinji; Aoyama, Youichi; Matsuoka, Yukihiro; and Hiroshima, Tatsuo, 5,151,671, Cl. 335-172.000.

Takayama, Toru, to Nikon Corporation. Zoom lens barrel. 5,151,729, Cl. 354-195.120.

Takebuchi, Masataka, to Kabushiki Kaisha Toshiba. Nonvolatile semiconductor memory device with isolated gate electrodes. 5,151,761, Cl. 357-23.500.

Takechi, Kazuo: *See*—
Kameyama, Shoju; Miyano, Kenmi; Hashimoto, Motonori; Takechi, Kazuo; Ohmura, Takao; Hirao, Yutaka; Uemura, Yahiro; and Yokoyama, Kazumasa, 5,151,499, Cl. 530-381.000.

Takeda Chemical Industries, Ltd.: *See*—
Goto, Jugo; Kubota, Tsutomu; Kotani, Reiichi; and Miyaji, Masuo, 5,151,454, Cl. 522-93.000.

Takeda, Etsuya; Nanno, Yutaka; and Nagata, Seiichi, to Matsushita Electric Industrial Co., Ltd. Capacitively coupled driving method for TFT-LCD to compensate for switching distortion and to reduce driving power. 5,151,805, Cl. 359-57.000.

Takegahara, Toshiyuki: *See*—
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.

Takemoto, Shinichi; Hasegawa, Hirofumi; Toyoshi, Naoki; Oka, Tateki; Goto, Hiroshi; and Yoshida, Narutaka, to Minolta Camera Kabushiki Kaisha. Device for conveying developer in a developing device. 5,151,738, Cl. 355-245.000.

Takenouchi, Hidemi: *See*—
Fukuda, Nobuhiro; Kobayashi, Sadao; Miyachi, Kenji; Takenouchi, Hidemi; Kawahara, Yoji; and Teramoto, Takayuki, 5,151,255, Cl. 422-186.050.

Takeshita, Sachio: *See*—
Ishihara, Makoto; Kiminami, Kazuhiro; Wakabayashi, Masakazu; Hori, Hirokazu; Tatsu, Sancharu; and Takeshita, Sachio, 5,151,234, Cl. 264-176.100.

Takeuchi, Atsushi, to Fujitsu Limited. Optical system using spin-dependent optical nonlinearity. 5,151,589, Cl. 250-213.00A.

Takeuchi, Hiroshi: *See*—
Nagatsuka, Sumiya; Takeuchi, Hiroshi; and Karasawa, Haruo, 5,151,947, Cl. 382-6.000.

Takeuchi, Kouji: *See*—
Kawaguchi, Hideo; Takeuchi, Kouji; Ishibashi, Tadashi; Shimizu, Norio; and Odawara, Yoji, 5,151,362, Cl. 435-240.250.

Takeuchi, Tatsuo; and Amemiya, Koji, to Canon Kabushiki Kaisha. Output sheet for image forming device and image forming device by use of the sheet. 5,151,313, Cl. 428-192.000.

Talwar, Ashok K., to American Nucleonics Corporation. Highly directive radio receiver employing relatively small antennas. 5,152,010, Cl. 455-136.000.

Tamada, Kenji; Nakajima, Hirokazu; Okayama, Akio; and Mizutani, Takahiro, to NTN Corporation. Grease-sealed bearing with oxide layers. 5,150,974, Cl. 384-463.000.

Tamagawa, Akio, to NEC Corporation. Oscillation stoppage detection circuit. 5,151,666, Cl. 331-64.000.

Tamai, Kiminori, to TDK Corporation. Magnetic powder for magnetic recording media and method for producing same. 5,151,115, Cl. 75-348.000.

Tamamura, Koushi; and Iwamoto, Hiroyuki, to Sony Corporation. Semiconductor laser. 5,151,912, Cl. 372-46.000.

Tamura, Kozaburo: *See*—
Aoki, Hiroyuki; Suzuki, Tadashi; Katahata, Toshio; Haino, Mutsuo; Nishimura, Genshiro; Kaya, Hiroshi; Tamura, Kozaburo; and Isoda, Takeshi, 5,151,390, Cl. 501-95.000.

Tamura, Sachio: *See*—
Hirakawa, Tadao; Tamura, Sachio; and Sasanami, Hiromitsu, 5,151,118, Cl. 65-18.100.

Tanaka, Hideaki: *See*—
Hirata, Toichi; Tanaka, Hideaki; Sugiyama, Genroku; and Kajita, Yusuke, 5,150,574, Cl. 60-465.000.

Tanaka, Hiroji: *See*—
Hayashi, Nobuharu; and Tanaka, Hiroji, 5,150,744, Cl. 114-230.000.

Tanaka, Ichiro; Sasaki, Seiji; Kakubari, Zen-ichi; and Kojima, Osamu, to Zexel Corporation. Air conditioning distribution system. 5,151,063, Cl. 454-258.000.

Tanaka, Kuniyoshi; Shirouzu, Shunji; Ohta, Minoru; and Miyagawa, Hideo, to Kabushiki Kaisha Toshiba. Surface potential measuring system. 5,151,659, Cl. 324-458.000.

Tanaka, Masaaki: *See*—
Ohnaka, Hidemi; Tanaka, Masaaki; Kato, Yuuichi; Furuhashi, Michio; Satoya, Koichi; and Ooi, Yasuhiro, 5,150,693, Cl. 123-559.300.

Tanaka, Masaru; and Ishii, Yutaka, to Sharp Kabushiki Kaisha. Input-/output display panel with light pen. 5,151,688, Cl. 340-707.000.

Tanaka, Masato: *See*—
Hayashi, Teruyuki; Kobayashi, Toshiaki; and Tanaka, Masato, 5,151,538, Cl. 556-431.000.

Tanaka, Mitsuho, to Kel Corporation. Electrical connector for repeated connection to integrated circuit grid array devices. 5,151,040, Cl. 439-73.000.

Tanaka, Morimasa, to Ichikoh Industries, Ltd. Remote control switch for posture adjustment of automotive mirrors. 5,151,563, Cl. 200-6.00A.

Tanaka, Saburo; Nakanishi, Hidenori; and Itozaki, Hideo, to Sumitomo Electric Industries, Ltd. Process for preparing a-axis oriented high-temperature superconducting thin films. 5,151,408, Cl. 505-1.000.

Tanaka, Shoji; Tsujimoto, Masafumi; Wada, Yayoi; Tsuruoka, Nobuo; and Nakazato, Hiroshi, to Suntory Limited. Method for expressing polypeptide having anti-tumor activity. 5,151,349, Cl. 435-69.100.

Tanaka, Toshihiro: *See*—
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.

Tanaka, Toshizumi: *See*—
Ishiguro, Masaaki; Tanaka, Toshizumi; and Takagi, Yukio, 5,150,715, Cl. 128-662.060.
Tanaka, Yasundo: *See*—
Miyanaga, Hirofumi; Sakamoto, Nobuyuki; Yoshimitsu, Koichi; and Tanaka, Yasundo, 5,150,702, Cl. 128-6.000.
Tanaka, Yoshikazu: *See*—
Iwasawa, Kyoko; Tanaka, Yoshikazu; and Gotou, Shizuo, 5,151,991, Cl. 395-700.000.
Tanaka, Yoshinori; Taniguchi, Tomohiko; Amano, Fumio; Ohta, Yasuji; and Unagami, Sigeyuki, to Fujitsu Limited. Vector quantization encoder and vector quantization decoder. 5,151,968, Cl. 3[illegible]-2.000.
Tanaka, Yutaka: *See*—
Kanatsugu, Yasuaki; Kurita, Taiichiro; Nishizawa, Taiji; Tanaka, Yutaka; Yajima, Ryoichi; Suzuki, Shoichi; Kato, Hisakazu; Enami, Kazumasa; Okuda, Haruo; Koizumi, Satoru; Suganami, Hideki; Takegahara, Toshiyuki; and Watanabe, Kaoru, 5,151,779, Cl. 358-12.000.
Tani, Masayuki; Nakanishi, Kunio; Kawabata, Atsushi; Watanabe, Norito; Yokoyama, Takanori; and Tanifuji, Shinya, to Hitachi, Ltd. Data display method. 5,151,974, Cl. 395-128.000.
Tanifuji, Shinya: *See*—
Tani, Masayuki; Nakanishi, Kunio; Kawabata, Atsushi; Watanabe, Norito; Yokoyama, Takanori; and Tanifuji, Shinya, 5,151,974, Cl. 395-128.000.
Taniguchi, Tomohiko: *See*—
Tanaka, Yoshinori; Taniguchi, Tomohiko; Amano, Fumio; Ohta, Yasuji; and Unagami, Sigeyuki, 5,151,968, Cl. 395-2.000.
Taniguchi, Yoshiaki; Watanabe, Masaki; Iizawa, Ryuji; and Mori, Fumitoshi, to Jidoshi Kiki Co., Ltd.; and Fujitsu, Ltd. Control method for electric power steering apparatus for vehicle. 5,151,860, Cl. 364-424.050.
Tanimoto, Akikazu; and Kamiya, Saburo, to Nikon Corporation. Method of and apparatus for measuring coordinate position and positioning an object. 5,151,749, Cl. 356-375.000.
Tannenbaum, Michael A., to PCI/Delvco, Inc. Device for inhibiting removal of an article from a blister-type container. 5,150,793, Cl. 206-531.000.
Tardy, Andre : *See*—
Brehm, Claude; Boniort, Jean-Yves; Tardy, Andre ; and Com-Nougue, Jacques, 5,151,966, Cl. 385-128.000.
Tarlow, Kenneth A.: *See*—
Benveniste, Edgar R.; Tarlow, Kenneth A.; Goodman, Harold; and Benveniste, Gloria H., 5,150,953, Cl. 312-9.580.
Tashjian, Michael D. Underground pipe locating apparatus. 5,151,657, Cl. 324-326.000.
Tatara, Shinji; and Okayasu, Masami, to Kabushiki Kaisha Toshiba. Cycloconverter and the method of controlling the same. 5,151,853, Cl. 363-160.000.
Tatebayashi, Tsuneo; Uno, Yoshio; and Hiei, Masaichi, to Fuji Electric Co., Ltd. Laser therapeutic apparatus. 5,150,704, Cl. 128-395.000.
Tateishi, Megumi: *See*—
Sato, Mitsuo; Shaura, Hazime; and Tateishi, Megumi, 5,151,276, Cl. 425-110.000.
Tatsu, Haruyoshi: *See*—
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Tatsu, Saneharu: *See*—
Ishihara, Makoto; Kiminami, Kazuhiro; Wakabayashi, Masakazu; Hori, Hirokazu; Tatsu, Saneharu; and Takeshita, Sachio, 5,151,234, Cl. 264-176.100.
Tayama, Suehiro: *See*—
Ikeda, Hiroyuki; Shinka, Michitoshi; Tayama, Suehiro; Sawano, Tetuya; and Saruta, Masahiro, 5,151,482, Cl. 526-329.700.
Taylor, Bruce G.: *See*—
Giordano, Edward C.; O'Brien, Mark; Petrucci, Raymond M.; and Taylor, Bruce G., 5,151,180, Cl. 210-264.000.
Taylor, Chandler R., Jr.; Cale, Albert D., Jr.; Johnson, David N.; and Stauffer, Harold F., Jr., to A. H. Robins Company, Incorporated. Method of treating muscular tension, muscle spasticity and anxiety with 3-aryloxy and 3-arylthioazetidinecarboxamides. 5,151,418, Cl. 514-210.000.
Taylor, Colin M.: *See*—
Emerson, Terence P.; Bescoby, Frank A.; Taylor, Colin M.; and Payne, George K., 5,151,022, Cl. 423-245.300.
Taylor, Donald R.: *See*—
Sedath, Robert H.; Taylor, Donald R.; and White, Lloyd S., 5,151,183, Cl. 210-500.410.
Taylor, John N.: *See*—
Bach, Ulf-Eiel F.; Rueter, Rodney N.; and Taylor, John N., 5,151,179, Cl. 210-250.000.
Taylor, Raymond L.: *See*—
Goela, Jitendra S.; Pickering, Michael; and Taylor, Raymond L., 5,150,507, Cl. 29-460.000.
Taylor, Terrance N.: *See*—
Emmert, Steven C.; Carlson, Kenneth W.; Lundell, Louis J.; Mischenko, Nicholas; Taylor, Terrance N.; and Nagele, Albert L., 5,151,643, Cl. 320-2.000.
TDK Corporation: *See*—
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Technical Research Associates, Inc.: *See*—
Brimhall, Owen D.; Bowers-Irons, Gail A.; and Weeks, Joseph K., Jr., 5,151,368, Cl. 435-312.000.
Technion R & D Found. Ltd.: *See*—
Halmann, Menachem; Azhari, Haim; Beyar, Rafael; Sideman, Samuel; and Dinnar, Uri, 5,151,856, Cl. 364-413.030.
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Technophone Limited: *See*—
Martensson, Nils E., 5,151,946, Cl. 379-38.000.
Tecnol Medical Products, Inc.: *See*—
Hubbard, Vance M.; and Brunson, Welton K., 5,150,703, Cl. 128-206.120.
Teeple, Edward, Jr. Laser shield with indicator means. 5,151,095, Cl. 606-2.000.
Tees, Alistair A.; and Kenney, Glen E., to Fina Technology, Inc. Vapor recovery system for vehicle loading operation. 5,151,111, Cl. 55-164.000.
Tegth, Ulf: *See*—
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Tektronix, Inc.: *See*—
Hadwin, Matthew J., 5,151,775, Cl. 357-80.000.
Telemecanique: *See*—
Guinet, Jannick; Hubert, Jean-Claude; Jarrige, Jean; Mexmain, Jacques; and Michelet, Jean-Pascal, 5,150,830, Cl. 228-124.000.
Telettra S.p.A.: *See*—
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Televerket: *See*—
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Temay S.p.A.: *See*—
Contursi, Luigi; and Beaulardi, Leandro, 5,151,260, Cl. 423-412.000.
Tepic, Slobodan; Perren, Stephen; Straumann, Fritz; and Sutter, Franz, to Synthes (U.S.A.). Point contact bone compression plate. 5,151,103, Cl. 606-69.000.
Terai, Fumitaka; Yamagami, Hiroyuki; Uchino, Nobuhiko; and Okazaki, Masaki, to Fuji Photo Film Co. Ltd. Process for preparing a silver halide emulsion. 5,151,346, Cl. 430-546.000.
Teramoto, Takayuki: *See*—
Fukuda, Nobuhiro; Kobayashi, Sadao; Miyachi, Kenji; Takenouchi, Hidemi; Kawahara, Yoji; and Teramoto, Takayuki, 5,151,255, Cl. 422-186.050.
Terao, Hidetoshi: *See*—
Miyazawa, Kenji; and Terao, Hidetoshi, 5,150,958, Cl. 362-66.000.
Terashi, Kozo; and Oba, Toshio, to Kabushiki Kaisha Toshiba. Therapeutic bed of radiotherapeutic system. 5,151,931, Cl. 378-65.000.
Terex Corporation: *See*—
Fujan, Steven J.; and Loeber, Frederick W., 5,150,942, Cl. 296-190.000.
Terumo Kabushiki Kaisha: *See*—
Nakamura, Hideki, 5,151,603, Cl. 250-458.100.
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Schlecker, Rainer; Teschendorf, Hans-Juergen; and Unger, Liliane, 5,151,437, Cl. 514-320.000.
Teshima, Nobue: *See*—
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Texaco Chemical Company: *See*—
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Campbell, Teddy G., 5,150,730, Cl. 137-364.000.
Culpon, Douglas H., Jr., 5,151,205, Cl. 252-56.00R.
Texas Instruments Incorporated: *See*—
Gill, Manzur; and McElroy, David J., 5,151,760, Cl. 357-23.500.
Hynecek, Jaroslav, 5,151,380, Cl. 437-53.000.
Mydill, Marc R.; and O'Keefe, Sheila, 5,151,903, Cl. 371-27.000.
Nelson, William E., 5,151,718, Cl. 346-160.000.
Schreck, John F.; and Truong, Phat C., 5,151,880, Cl. 365-201.000.
Thames Water Utilities Limited: *See*—
Smith, Alan J.; and Quinn, Jennifer J., 5,151,197, Cl. 210-758.000.
Thayer, Edward B.: *See*—
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Theeuwes, Felix; and Yum, Su I., to Alza Corporation. Osmotically driven syringe with programmable agent delivery. 5,151,093, Cl. 604-892.100.
Theissing, Gerhard: *See*—
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Theobald, Hans: *See*—
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Mueller, Stefan; Theobald, Hans; Wolf, Bernd; Hofmeister, Peter; Kardorff, Uwe; and Kuenast, Christoph, 5,151,441, Cl. 514-378.000.
Theurer, Josef; and Oellerer, Friedrich, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Freight car for bulk material. 5,151,002, Cl. 414-339.000.
Thijs, Petrus J. A.; and Tiemeijer, Lukas F., to U.S. Philips Corp. Semiconductor optical amplifier. 5,151,818, Cl. 359-344.000.
Thinking Machines Corporation: *See*—
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Hillis, W. Daniel, 5,151,996, Cl. 395-800.000.
Thiokol Corporation: *See*—
Grosgebauer, Roger A.; and White, C. Max, 5,150,654, Cl. 102-202.000.
Thomas, Charles L.: *See*—
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Thomas, Robert E.; Varghese, George; Souza, Robert J.; and Harvey, George A., to Digital Equipment Corporation. Tracking sequence numbers in packet data communication system. 5,151,899, Cl. 370-94.100.

Thompson, Duncan C. Weather resistant, fire retardant preservative and protective compositions for the treatment of wood and cellulose products. 5,151,127, Cl. 106-15.050.

Thompson, Ian R.: *See—*
McKay, Michael L.; Thompson, Ian R.; and Sarich, Ralph T., 5,150,836, Cl. 239-5.000.

Thomson-CSF: *See—*
Couturier, Alain, 5,151,802, Cl. 359-51.000.
Nicolas, Christophe, 5,151,825, Cl. 359-634.000.

Thornthwaite, John B.; and Naismith, Robert, to Games Workshop Limited. Injection moulding process. 5,151,232, Cl. 264-130.000.

Thoroughman, Glenn R. Keyway broach guide assembly. 5,150,996, Cl. 409-259.000.

Thrower, Craig S.; and Wang, King C., to Vitelic Corporation. CMOS logic circuit with output coupled to multiple feedback paths and associated method. 5,151,622, Cl. 307-475.000.

Thunderbird Technologies, Inc.: *See—*
Vinal, Albert W., 5,151,759, Cl. 357-23.300.

Thuries, Edmond, to GEC Alsthom SA. Circuit breaker control apparatus. 5,151,567, Cl. 200-148.00F.

Tice, Robert J., Jr.: *See—*
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Tiemeijer, Lukas F.: *See—*
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Titan Corporation, The: *See—*
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Tobita, Hideyuki: *See—*
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Tobita, Minoru: *See—*
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Tod, Michel: *See—*
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Toda, Atsushi: *See—*
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Togai, Kazuhide: *See—*
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Tohyama, Noboru: *See—*
Arahara, Kohzoh; Yuasa, Toshiya; Kai, Takashi; Tohyama, Noboru; Mouri, Akihiro; and Matsumoto, Kenichi, 5,151,712, Cl. 346-1.100.

Tokairin, Shigeru; and Nishimaki, Tetsuo, to Nisshin Flour Milling Co., Ltd.; and Tsukishima Foods Co., Ltd. Glycerides of eicosapentaenoic acid, processes for preparing the same and oil and fat products containing the same. 5,151,291, Cl. 426-581.000.

Toki, Shigeyuki: *See—*
Imai, Isamu; Yotsumoto, Toshihiro; Inada, Norio; Toki, Shigeyuki; Sato, Maki; and Wada, Ichiro, 5,151,142, Cl. 152-565.000.

Tokuda, Shoichi: *See—*
Otsuka, Saburo; Ito, Yuusuke; Yoshikawa, Toshiyuki; and Tokuda, Shoichi, 5,151,271, Cl. 424-443.000.

Tokui, Yasuyuki: *See—*
Yuki, Syoji; Tokui, Yasuyuki; Nishiuchi, Kihachiro; Wada, Kenichi; Suzue, Masayoshi; and Morimoto, Takuo, 5,150,905, Cl. 273-218.000.

Tokunaga, Hiroyuki, to Canon Kabushiki Kaisha. Method for forming polycrystalline film by chemical vapor deposition process. 5,151,296, Cl. 427-38.000.

Tokunaga, Katsushi: *See—*
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 5,151,206, Cl. 252-62.510.

Tokunaga, Tatsuyuki; Aoyama, Keisuke; Fukahori, Hidehiko; Suda, Yasuo; and Akashi, Akira, to Canon Kabushiki Kaisha. Focus adjustment device having restricting means for restricting a selecting action according to the degree of nearness of a distance measurement. 5,151,583, Cl. 250-201.200.

Tokyo Electric Co., Ltd.: *See—*
Yamaguchi, Yasuyoshi, 5,151,742, Cl. 355-285.000.

Tokyo Electron Kyushu Limited: *See—*
Matsumura, Kimiharu; Sakai, Hiroyuki; Murakami, Masaaki; Oda, Tetsuya; and Yamaguchi, Chizo, 5,151,871, Cl. 364-557.000.

Tokyo Electron Limited: *See—*
Kaneko, Satoshi, 5,150,882, Cl. 251-193.000.
Matsumura, Kimiharu; Sakai, Hiroyuki; Murakami, Masaaki; Oda, Tetsuya; and Yamaguchi, Chizo, 5,151,871, Cl. 364-557.000.
Shibata, Junichirou, 5,150,797, Cl. 209-573.000.
Shibata, Junichirou, 5,151,651, Cl. 324-158.00P.

Tokyo Electron Yamanashi Limited: *See—*
Shibata, Junichirou, 5,150,797, Cl. 209-573.000.
Shibata, Junichirou, 5,151,651, Cl. 324-158.00P.

Tokyo Tanabe Company, Limited: *See—*
Murakami, Kiyokazu; and Yokura, Susumu, 5,151,450, Cl. 514-690.000.

Tokyo Tatsuno Co., Ltd.: *See—*
Motohashi, Toshiaki; Harada, Yooichi; and Yanagihara, Tsuyoshi, 5,150,742, Cl. 141-59.000.

Tom, Glenn M., to Novapure Corporation. Bulk gas sorption and apparatus, gas containment/treatment system comprising same, and sorbent composition therefor. 5,151,395, Cl. 502-67.000.

Tomasov, Glenn E.; and Schmidt, Annette M., to General Motors Corporation. Method and apparatus for detecting low refrigerant charge. 5,150,584, Cl. 62-209.000.

Tomoe Technical Research Co.: *See—*
Jiro, Kamezawa, 5,150,731, Cl. 137-375.000.

Tomoegawa Paper Co., Ltd.: *See—*
Suzuki, Akira; Norizuki, Takayuki; and Yamanashi, Yasuhiro, 5,151,403, Cl. 503-200.000.

Toray Industries, Inc.: *See—*
Kimoto, Yukitane; Murata, Kohzou; and Muraki, Toshio, 5,151,322, Cl. 428-303.000.

Torii, Nobutoshi; and Wakio, Hiroshi, to Fanuc Ltd. Optical distance sensor using a laser beam and processing means. 5,151,608, Cl. 250-561.000.

Toso Susteel Co., Ltd.: *See—*
Inoue, Hiroshi; Kato, Toshikazu; and Ogawara, Kensuke, 5,151,495, Cl. 528-388.000.

Tosoh Corporation: *See—*
Inoue, Hiroshi; Kato, Toshikazu; and Ogawara, Kensuke, 5,151,495, Cl. 528-388.000.
Iwasaki, Shuji; Kagayama, Toshi; and Kamata, Kazuya, 5,150,821, Cl. 222-132.000.

Toto Ltd.: *See—*
Watanabe, Toshiya; and Kitabayashi, Tetsuo, 5,151,845, Cl. 361-234.000.

Tour-Mate Systems Canada Limited: *See—*
Poch, Neil, 5,152,003, Cl. 455-18.000.

Towner, Mark E.: *See—*
Salamy, Thomas E.; Love, Marvin L., Jr.; and Towner, Mark E., 5,151,219, Cl. 252-364.000.

Townsend, Peter K.: *See—*
Fusselman, David F.; and Townsend, Peter K., 5,151,036, Cl. 439-108.000.

Toyoda, Eiji: *See—*
Takada, Kazuaki; Kanari, Masayuki; Yajima, Makoto; and Toyoda, Eiji, 5,151,637, Cl. 318-376.000.

Toyoda Gosei Co., Ltd.: *See—*
Fujita, Yoshiyuki; and Sakane, Katsunobu, 5,150,920, Cl. 280-777.000.

Toyoda, Takashi: *See—*
Yamada, Minoru; and Toyoda, Takashi, 5,151,731, Cl. 354-324.000.

Toyoshi, Naoki: *See—*
Takemoto, Shinichi; Hasegawa, Hirofumi; Toyoshi, Naoki; Oka, Tateki; Goto, Hiroshi; and Yoshida, Narutaka, 5,151,738, Cl. 355-245.000.

Toyoshima, Isao: *See—*
Noto, Kazuyuki; and Toyoshima, Isao, 5,151,672, Cl. 333-189.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Ohnaka, Hidemi; Tanaka, Masaaki; Kato, Yuuichi; Furuhashi, Michio; Satoya, Koichi; and Ooi, Yasuhiro, 5,150,693, Cl. 123-559.300.
Okawa, Koji; and Norota, Kazuhiko, 5,150,686, Cl. 123-698.000.
Shamoto, Sumikazu, 5,151,641, Cl. 318-762.000.

Tozu, Kenji: *See—*
Kuwana, Kazutaka; Yoshida, Tsuyoshi; Ichikawa, Hiroyuki; and Tozu, Kenji, 5,150,952, Cl. 303-109.000.

Trahan, Paul A.: *See—*
Maher, David L.; Rodriquez, Callista M.; and Trahan, Paul A., 5,151,556, Cl. 89-35.010.

Trainor, George L.: *See—*
Hobbs, Frank W., Jr.; and Trainor, George L., 5,151,507, Cl. 536-23.000.

Tran, Dung Q.: *See—*
Shah, Bakulesh N.; Tran, Dung Q.; and Keene, Donna L., 5,151,546, Cl. 560-130.000.

Treybig, Duane S.; Wang, David S.; Sheih, Pong S.; and Ho, Loan A., to Dow Chemical Company, The. Advanced epoxy compositions, curable compositions and cured products. 5,151,485, Cl. 528-87.000.

Troilo, Joseph A., Jr.: *See—*
Davis, Archie B.; and Troilo, Joseph A., Jr., 5,151,150, Cl. 156-384.100.

Trombley, Douglass E.; Stiles, Steven D.; Buslepp, Kenneth J.; and Buslepp, Kenneth J., to General Motors Corporation. System for controlling air supply pressure in a pneumatic direct fuel injected internal combustion engine. 5,150,692, Cl. 123-533.000.

Trommer, Gert: *See*—
Buhler, Wolfhardt; Poisel, Hans; and Trommer, Gert, 5,150,956, Cl. 356-350.000.
Troncoso, Vincent F., to Golden Key Futura, Inc. Archery bow assembly. 5,150,700, Cl. 124-44.500.
Trowbridge, Christian A.: *See*—
Kofsky, Irving L.; and Trowbridge, Christian A., 5,151,746, Cl. 356-1.000.
Troxell, John R., to General Motors Corporation. Flat panel emissive display with redundant circuit. 5,151,632, Cl. 315-169.100.
Troxler Electronic Laboratories, Inc.: *See*—
Regimand, Ali, 5,151,601, Cl. 250-390.040.
True Pitch, Inc.: *See*—
Kviesitis, Boris, 5,151,123, Cl. 106-287.170.
Trunk, Reinhard: *See*—
Nothdurft, Heinz; Trunk, Reinhard; Sprenger, Kurt; and Alvarez-Avila, Carlos, 5,150,688, Cl. 123-506.000.
Truong, Hieu C.; and Dilay, Maria, to Royal Canadian Mint. Coins coated with nickel, copper and nickel and process for making such coins. 5,151,167, Cl. 205-102.000.
Truong, Phat C.: *See*—
Schreck, John F.; and Truong, Phat C., 5,151,880, Cl. 365-201.000.
Tsuda, Hiroshi: *See*—
Nakayama, Okihiko; Tsuda, Hiroshi; Mizushima, Katsuhiko; Itoh, Toshiyuki; and Ueno, Hiroshi, 5,151,862, Cl. 364-454.000.
Tsuda, Satoru: *See*—
Sunaoka, Yoshio; Kitazato, Keisuke; and Tsuda, Satoru, 5,151,191, Cl. 210-644.000.
Tsuda, Tadayuki; Watanabe, Kazushi; Ikemoto, Isao; and Sasaki, Shinichi, to Canon Kabushiki Kaisha. Process cartridge detachably mountable to image forming apparatus featuring a peripherally supported image bearing drum. 5,151,734, Cl. 355-200.000.
Tsui, Pui-Hing. Joy light structure. 5,150,964, Cl. 362-251.000.
Tsujimoto, Masafumi: *See*—
Tanaka, Shoji; Tsujimoto, Masafumi; Wada, Yayoi; Tsuruoka, Nobuo; and Nakazato, Hiroshi, 5,151,349, Cl. 435-69.100.
Tsukada, Toshihisa: *See*—
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, 5,151,385, Cl. 437-181.000.
Tsukamoto, Manabu: *See*—
Goto, Kenji; Tsukamoto, Manabu; Ishida, Masayuki; and Ishida, Yoshinobu, 5,151,830, Cl. 360-32.000.
Tsukishima Foods Co., Ltd.: *See*—
Tokairin, Shigeru; and Nishimaki, Tetsuo, 5,151,291, Cl. 426-581.000.
Tsukushi, Masanori: *See*—
Koyanagi, Osamu; Seki, Yasuharu; and Tsukushi, Masanori, 5,151,566, Cl. 200-110.00A.
Tsumuji, Akio: *See*—
Takahashi, Kaoru; Tsumuji, Akio; and Shutoku, Ryuji, 5,151,683, Cl. 340-518.000.
Tsunoda, Isao: *See*—
Yoshida, Suguru; Tsunoda, Isao; and Sano, Shoichi, 5,150,944, Cl. 296-203.000.
Tsuruoka, Nobuo: *See*—
Tanaka, Shoji; Tsujimoto, Masafumi; Wada, Yayoi; Tsuruoka, Nobuo; and Nakazato, Hiroshi, 5,151,349, Cl. 435-69.100.
Tuchida, Manabu: *See*—
Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000.
Tucker, Clifton E. Disc sander implement. 5,150,546, Cl. 51-170.00T.
Tuller, Barry E.: *See*—
Griffith, Scott E.; Tuller, Barry E.; and Jackson, Charles L., 5,151,884, Cl. 368-10.000.
Turner, John T.; and Popiel, Czeslaw O., to Schlumberger Industries, Limited. Vortex flowmeters. 5,150,619, Cl. 73-861.220.
Tuttle, Mark E.: *See*—
Gilton, Terry L.; Tuttle, Mark E.; and Cathey, David A, 5,151,168, Cl. 205-123.000.
Twyman, Jeffrey R. Method of preparing green beans and the resulting product. 5,151,284, Cl. 426-106.000.
Ty-Breakers Corp.: *See*—
Kuczynski, Charles P., 5,150,660, Cl. 112-402.000.
Uchida, Hirohsi: *See*—
Irikura, Tsutomu; Uchida, Hirohsi; Imai, Jun; and Komuro, Masakatsu, 5,151,434, Cl. 514-300.000.
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, to Japan Tobacco Inc.; and Yoshotomi Pharmaceutical Industries, Ltd. Histidyl peptide derivatives. 5,151,497, Cl. 530-331.000.
Uchida, Masami: *See*—
Kawahara, Katsumi; Uchida, Masami; Yoshioka, Kazumi; Ohta, Takeo; and Horai, Keiichiro, 5,151,295, Cl. 427-12.000.
Uchida, Takayuki; Ide, Satoshi; Yamamoto, Masahiro; and Yumoto, Atsushi, to Nippon Steel Corp.; and Nittetsu Plant Designing Corp. Apparatus for scribing grain-oriented electrical steel strip. 5,150,598, Cl. 72-325.000.
Uchino, Nobuhiko: *See*—
Terai, Fumitaka; Yamagami, Hiroyuki; Uchino, Nobuhiko; and Okazaki, Masaki, 5,151,346, Cl. 430-546.000.
Uchiyama, Yuji: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Asakura, Tsutou; Furuya, Masato; Koyama, Yoshihisa; and Uchiyama, Yuji, 5,151,781, Cl. 358-45.000.
Udagawa, Tsunekazu, to Ishikawa Gasket Co., Ltd. Gasket with soft and hard seal coatings. 5,150,910, Cl. 277-235.00B.
Ueda, Katsunori: *See*—
Danno, Yoshiaki; Togai, Kazuhide; Yoshida, Masato; Ueda, Katsunori; and Shimada, Makoto, 5,151,861, Cl. 364-426.020.
Ueda, Toru; Ishizuka, Yasushi; Togawa, Fumio; and Aramaki, Takashi, to Sharp Kabushiki Kaisha. Character recognition device which divides a single character region into subregions to obtain a character code. 5,151,951, Cl. 382-19.000.
Uemura, Tsuyoshi: *See*—
Wakita, Naohide; Iwai, Yoshio; Uemura, Tsuyoshi; Ohnishi, Hiroyuki; Johten, Kazuhiro; Kimura, Satoshi; and Fujiwara, Shozo, 5,151,803, Cl. 359-56.000.
Uemura, Yahiro: *See*—
Kameyama, Shoju; Miyano, Kenmi; Hashimoto, Motonori; Takechi, Kazuo; Ohmura, Takao; Hirao, Yutaka; Uemura, Yahiro; and Yokoyama, Kazumasa, 5,151,499, Cl. 530-381.000.
Uenishi, Akio; Yamaguchi, Hiroshi; and Fukumochi, Yasuaki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device, fabricating method thereof and flash control device using the semiconductor device. 5,151,762, Cl. 357-23.400.
Ueno, Hiroshi: *See*—
Nakayama, Okihiko; Tsuda, Hiroshi; Mizushima, Katsuhiko; Itoh, Toshiyuki; and Ueno, Hiroshi, 5,151,862, Cl. 364-454.000.
Ueno, Ryuji: *See*—
Ueno, Ryuzo; Ueno, Ryuji; and Oda, Tomio, 5,151,444, Cl. 514-530.000.
Ueno, Ryuzo; Ueno, Ryuji; and Oda, Tomio, to K.K. Ueno Seiyaku Oyo Kenkyujo. Ocular hypotensive agents. 5,151,444, Cl. 514-530.000.
Ueno, Yoshiyasu, to NEC Corporation. Semiconductor laser. 5,151,913, Cl. 372-46.000.
Ukawa, Naohiko: *See*—
Ebara, Ryuichiro; Nakamoto, Hideo; Ukawa, Naohiko; Yamada, Tamotsu; and Nishimura, Yasuo, 5,151,248, Cl. 420-35.000.
Umeda, Kimitoshi: *See*—
Sakamoto, Noriyasu; Kisida, Hirosi; Fujimoto, Hiroaki; Umeda, Kimitoshi; and Matsuo, Noritada, 5,151,428, Cl. 514-277.000.
Umeda, Narumi: *See*—
Onoe, Seizo; and Umeda, Narumi, 5,151,693, Cl. 340-825.300.
Umeda, Shinichiro: *See*—
Kuwajima, Teruaki; Umeda, Shinichiro; Watanabe, Masakazu; and Konishi, Sakuichi, 5,151,125, Cl. 106-503.000.
Umezawa, Tomoko: *See*—
Nishiguchi, Masayuki; Fujiwara, Yoshihito; and Umezawa, Tomoko, 5,151,941, Cl. 381-46.000.
Unagami, Sigeyuki: *See*—
Tanaka, Yoshinori; Taniguchi, Tomohiko; Amano, Fumio; Ohta, Yasuji; and Unagami, Sigeyuki, 5,151,968, Cl. 395-2.000.
Underdown, Jeffrey: *See*—
Norton, Ian T.; and Underdown, Jeffrey, 5,151,290, Cl. 426-576.000.
Unewisse, Heinz, to Mannesmann Aktiengesellschaft. Method for producing a locked, tight pipe-connection. 5,150,519, Cl. 29-890.140.
Unger, Liliane: *See*—
Schlecker, Rainer; Teschendorf, Hans-Juergen; and Unger, Liliane, 5,151,437, Cl. 514-320.000.
Uni-Charm Corporation: *See*—
Araki, Yozo; Ito, Isamu; Sugimura, Tohru; Suzuki, Migaku; and Ochi, Mitsuzo, 5,150,562, Cl. 53-438.000.
Uniden America Corporation: *See*—
Wentzler, David D., 5,151,665, Cl. 331-8.000.
Unilab Holdings, Ltd.: *See*—
Cook-Martin, David M., 5,150,883, Cl. 251-367.000.
Unilever Patent Holdings B.V.: *See*—
Griffiths, Thomas, 5,151,121, Cl. 106-600.000.
Unisys Corp.: *See*—
Canu, Jean Pierre; DesForges, Bernard; and Huette, Gerard, 5,151,952, Cl. 382-29.000.
United States of America
Air Force: *See*—
Finello, Duane, 5,151,848, Cl. 361-502.000.
Ryan, David M., 5,151,335, Cl. 429-223.000.
America: *See*—
Kotwal, Girish J.; and Moss, Bernard, 5,151,509, Cl. 536-27.000.
Army: *See*—
Bloemer, Mark J., 5,151,956, Cl. 385-11.000.
Bracuti, Arthur J.; and Bottei, Louis A., 5,151,557, Cl. 102-435.000.
Hsu, Fu-Lian; and Ashman, William P., 5,151,526, Cl. 548-335.000.
Commerce: *See*—
Bur, Anthony J.; Lowry, Robert E.; Roth, Steven C.; Thomas, Charles L.; and Wang, Francis W., 5,151,748, Cl. 356-32.000.
Energy: *See*—
Schwarz, Ricardo B.; and Kuokkala, Veli-Tapani, 5,150,617, Cl. 73-579.000.
Health and Human Services: *See*—
Hopper, Marvin L.; and King, Jerry W., 5,151,188, Cl. 210-634.000.
National Aeronautics and Space Administration: *See*—
Allison, Sidney G., 5,150,620, Cl. 73-862.590.

Holloway, Sidney E., III; Crossley, Edward A., Jr.; Jones, Irby W.; Miller, James B.; Davis, C. Calvin; Behun, Vaughn D.; and Goodrich, Lewis R., Sr., 5,150,875, Cl. 248-550.000.

Navy: *See*—
Kofsky, Irving L.; and Trowbridge, Christian A., 5,151,746, Cl. 356-1.000.
Miller, James E., 5,151,163, Cl. 204-153.110.
Pemsler, J. Paul; and Litchfield, John K., 5,151,262, Cl. 423-561.100.
Provenzano, Virgil; Singh, Anand K.; Imam, M. A.; Sadananda, Kuntimadi; and Henshaw, William F., 5,151,407, Cl. 505-1.000.

U.S. Philips Corporation: *See*—
Bergmans, Johannes W. M., 5,151,891, Cl. 369-59.000.
Chapman, David M., 5,151,780, Cl. 358-21.00R.
Gelin, Benoit; and Lebourg, Michel, 5,151,925, Cl. 375-82.000.
Josquin, Wilhelmus J. M. J.; Peters, Wilhelmus C. M.; and Van De Goor, Albertus T. M., 5,151,382, Cl. 437-74.000.
Jousselin, Christian P. M.; and Duranton, Marc A. G., 5,151,971, Cl. 395-27.000.
Kuijk, Karel E., 5,151,691, Cl. 340-784.000.
Politiek, Jarig; and Ligthart, Henricus J., 5,151,605, Cl. 250-492.200.
Rikken, Gerardus L. J. A.; and Seppen, Constance J. E., 5,151,965, Cl. 385-122.000.
Thijs, Petrus J. A.; and Tiemeijer, Lukas F., 5,151,818, Cl. 359-344.000.
Van Nes, Johannes C. A.; and Penninga, Johannes, 5,151,627, Cl. 313-477.00R.
Verhulst, Antonius G. H.; Hartmann, Wilbert J. A. M.; Stommels, Franciscus J.; and Luyckx-Smolders, Ann M. M., 5,151,804, Cl. 359-56.000.

United Technologies Corporation: *See*—
Cockerham, Jefre H.; and Thayer, Edward B., 5,150,862, Cl. 244-110.00B.
Moffitt, Robert C.; and Owen, Stephen J., 5,150,857, Cl. 244-12.200.
Moore, Jerry H., 5,151,013, Cl. 416-221.000.
Spadaccini, Louis J.; Marteney, Pierre J.; and Colket, Meredith B., III, 5,151,171, Cl. 208-48.00Q.

Unity Railway Supply Co., Inc.: *See*—
Grandy, Robert S., 5,150,658, Cl. 105-218.100.

University of California, The Regents of the: *See*—
Duh, Quan-Yang; and Way, Lawrence W., 5,151,086, Cl. 604-51.000.
Saltman, Paul D.; and Smith, Kenneth T., 5,151,274, Cl. 424-630.000.

University of Maryland, The: *See*—
Blanchard, William C.; and Lee, Cheng S., 5,151,164, Cl. 204-182.100.

University of New Mexico: *See*—
Bein, Thomas; Brown, Kelly D.; Frye, Gregory C.; and Brinker, Charles J., 5,151,110, Cl. 55-75.000.

University of Saskatchewan: *See*—
Babiuk, Lorne; van den Hurk, Sylvia; Zamb, Tim; and Fitzpatrick, David, 5,151,267, Cl. 424-89.000.

University of Washington, Board of Regents of the: *See*—
Bunton, Suzanne, 5,151,697, Cl. 341-51.000.

Uno, Kazuo; and Shirakawa, Junji, to Hitachi Koki Co., Ltd. Paper feed mechanism with plural support tables for supplying cut sheets to a printing apparatus. 5,150,893, Cl. 271-157.000.

Uno, Yoshio: *See*—
Tatebayashi, Tsuneo; Uno, Yoshio; and Hiei, Masaichi, 5,150,704, Cl. 128-395.000.

UOP: *See*—
Fettis, Michael E.; and Cottrell, Paul R., 5,151,392, Cl. 502-37.000.

Uosaki, Yoichi: *See*—
Nakano, Hirofumi; Kawada, Shozo; Uosaki, Yoichi; Saito, Yutaka; Gomi, Katsushige; and Iwazaki, Toshiaki, 5,151,352, Cl. 435-123.000.

Upatnieks, Juris, to Environmental Research Institute of Michigan. Compact hologram displays & method of making compact hologram. 5,151,800, Cl. 359-14.000.

Updike, William A.: *See*—
Johnson, Kenneth L.; and Updike, William A., 5,150,572, Cl. 60-272.000.

Urasaki, Shuji: *See*—
Suematsu, Noriharu; Takagi, Tadashi; and Urasaki, Shuji, 5,151,664, Cl. 330-149.000.

Urata, Hisao: *See*—
Fuchikami, Takamasa; and Urata, Hisao, 5,151,535, Cl. 554-226.000.

Urban, Paul L., to Cooper Industries, Inc. Electric soldering iron with plug-in tip temperature sensor. 5,151,574, Cl. 219-241.000.

Uribe, Juan R., to Motorola, Inc. Method and apparatus for detecting speech. 5,152,007, Cl. 455-116.000.

Urich, Manfred. Liquid level sensing device. 5,150,614, Cl. 73-308.000.

Urkowitz, Harry, to General Electric Company. Complementary-sequence pulse radar with matched filtering following doppler filtering. 5,151,702, Cl. 342-134.000.

Ushijima, Kazuhiro: *See*—
Sakakida, Masafumi; Iwamoto, Yasunori; Manabe, Toshiyuki; Muramoto, Hisao; Inada, Haruhiro; Hirashima, Isao; and Ushijima, Kazuhiro, 5,150,919, Cl. 280-732.000.

Usui, Masaaki: *See*—
Deguchi, Mikio; Itagaki, Takushi; and Usui, Masaaki, 5,151,373, Cl. 437-2.000.

Utpal, Goswami: *See*—
Perenyi, Andras; Utpal, Goswami; Arato, Mihaly; Frescka, Ede; Knoll, Jozsef; and Bela, D. Arpad, 5,151,419, Cl. 514-226.200.

Uytterhoeven, Herman J.: *See*—
Janssens, Wilhelmus; Uytterhoeven, Herman J.; Vermeersch, Joan T.; and Van der Bogaert, Jan A., 5,151,405, Cl. 503-227.000.

Uznanski, Bogdan: *See*—
Stec, Wojciech J.; Uznanski, Bogdan; Bergot, B. John; Hirschbein, Bernard L.; and Fearon, Karen L., 5,151,510, Cl. 536-27.000.

Vacher, Jacques: *See*—
Monnet, Olivier; and Vacher, Jacques, 5,151,599, Cl. 250-363.030.

Vacon, Gary; Visser, John A.; Engelse, Willem A. H.; and Metzger, Stephen D., to Digital Equipment Corporation. Terminal server architecture. 5,151,895, Cl. 370-85.100.

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Weissman, Bernard. Reamer/wrench/post kit. 5,150,788, Cl. 206-369.000.
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Rowe, Neal E., 5,151,564, Cl. 200-17.00R.
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Nettelbladt, Hans K.; and Widman, Karl M., 5,151,756, Cl. 357-17.000.
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Schmalstieg, Lutz; Hihlein, Peter; Pedain, Josef; and Wieczorrek, Wolfhart, 5,151,484, Cl. 528-45.000.
Wiedemann, Wolfgang, to Hoechst Aktiengesellschaft. Multilayer recording medium for optical information. 5,151,342, Cl. 430-271.000.
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Wiesmann, Rudolf. Installation for the disinfection of clarified sewage with UV apparatus built into siphons. 5,151,174, Cl. 210-97.000.
Wiesner, Mark G.: *See*—
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Wild, Jochen: *See*—
Hermeling, Dieter; Degner, Dieter; Harreus, Albrecht; Goetz, Norbert; Wild, Jochen; Theobald, Hans; and Wolf, Bernd, 5,151,548, Cl. 560-255.000.

Wilding, Peter: *See—*
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Wilhelm Fette GmbH, Firma: *See—*
Arndt, Ulrich; Luneburg, Peter; Marquardt, Kurt; Pierags, Hans-Joachim; and Zeuschner, Ulrich, 5,151,280, Cl. 425-186.000.

Wille, Ross M.; and Carter, Richard J., to Hewlett Packard Company. Distributed fair arbitration system using separate grant and request lines for providing access to data communication bus. 5,151,994, Cl. 395-800.000.

Williams, David M., to Raychem Limited. Amorphous silicon switch with forming current controlled by contact region. 5,151,384, Cl. 437-170.000.

Williams, Gregory J. Tow bar assembly. 5,150,911, Cl. 280-502.000.

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Chapman, William I., 5,150,569, Cl. 60-39.142.

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Moore, Jack S., Jr.; Cox, Johnny R.; and Williams, Mark L., 5,150,621, Cl. 73-863.910.

Williams, Paul J., to L'Nard Associates, Inc. Foot splint. 5,151,081, Cl. 602-27.000.

Williams, Rick L.; Leggott, Merton R.; and Bailey, Richard G., to Flakee Mills, Inc. Comestible processing system and method. 5,151,285, Cl. 426-241.000.

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Carter, Stephen A.; Williamson, Bryan C.; and Kozole, Karl H., 5,150,690, Cl. 123-527.000.

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Wilson, Geoffrey; Bradshaw, Timothy J.; and Lawson, Kenneth T., to Davy Mckee (Sheffield) Limited. Treatment of metal slabs. 5,150,599, Cl. 72-399.000.

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Winfield, Edward O., to Plant Services Corp. Fluid container capper apparatus. 5,150,559, Cl. 53-306.000.

Wing, Sharon: *See—*
Madou, Marc J.; Narang, Subhash C.; Otagawa, Takaaki; and Wing, Sharon, 5,151,224, Cl. 252-586.000.

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DeRisi, Joseph F.; Winston, Lonnie E.; Harrison, Dudley; and Rawson, Ken, 5,150,520, Cl. 29-890.013.

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Aupperlee, Patricia C.; and Wiswell, Beth R., 5,150,945, Cl. 297-184.000.

Witters, Jeffrey J.; Cheney, Brian A.; and Rioja, Roberto J., to Aluminum Company of America. Low aspect ratio lithium-containing aluminum extrusions. 5,151,136, Cl. 148-689.000.

Wittmann, Dieter; and Kubis, Heribert, to MAN Nutzfahrzeuge Aktiengesellschaft. Motor brake for air-compressing internal combustion engines. 5,150,678, Cl. 123-321.000.

Wittrisch, Christian: *See—*
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Wojik, Karl: *See—*
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Mueller, Stefan; Theobald, Hans; Wolf, Bernd; Hofmeister, Peter; Kardorff, Uwe; and Kuenast, Christoph, 5,151,441, Cl. 514-378.000.

Wolf, Sherman, to Wolf, Sherman. Computer-controlled radio-paging and telephone communication using recorded voice messages. 5,151,929, Cl. 379-57.000.

Wolfe, Richard A.; Im, Chang J.; and Wright, Robert E., to Coal Technology Corporation. Method and apparatus for converting coal into liquid fuel and metallurgical coke. 5,151,159, Cl. 202-118.000.

Wolford, Donald J., Jr.: *See—*
Meyerson, Bernard S.; Scott, Bruce A.; and Wolford, Donald J., Jr., 5,151,383, Cl. 437;101-.

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Wong, Jesse: *See—*
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Wong, Stephen L., to North American Philips Corp. Power integrated circuit having reverse-voltage protection. 5,151,767, Cl. 357-43.000.

Wood, Larry A. Siding clip. 5,150,555, Cl. 52-544.000.

Woods, Mark A., to Boeing Company, The. Inspection device for flush head bolts and rivets. 5,150,623, Cl. 73-865.800.

Woodward, William H. Linear actuator. 5,150,878, Cl. 251-129.010.

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Wortman, Alex. Sport striking articles. 5,150,897, Cl. 273-72.00R.

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Wolfe, Richard A.; Im, Chang J.; and Wright, Robert E., 5,151,159, Cl. 202-118.000.

WSP Ingenieurgesellschaft fur Warmetechnik, Stromungstechnik und Prozesstechnik mit beschrankter Haftung: *See—*
Kramer, Carl, 5,150,534, Cl. 34-155.000.

Wu, Chang-Fu. Mattress with sheet retaining means. 5,150,486, Cl. 5-460.000.

Wu, Chia L. Streamline chain. 5,151,066, Cl. 474-206.000.

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XEL Communications, Inc.: *See—*
Slife, Jimmy D.; and Farrell, David, 5,151,935, Cl. 379-240.000.

Xerox Corporation: *See—*
Bayley, Robert D.; and Hoffend, Thomas R., 5,151,338, Cl. 430-106.000.
Bol, Igor I., 5,151,153, Cl. 156-657.000.
Deisenroth, Harold G.; and Drawe, Jeffrey W., 5,150,781, Cl. 198-349.800.
Durland, Scott C.; Cassano, James R.; Dastin, Richard M.; and Swanson, Roger M., 5,151,745, Cl. 355-313.000.
Logtens, Jozef P. M., 5,150,826, Cl. 227-88.000.
Lundy, Douglas A.; Jugle, Kip L.; MacDonald, Daniel W.; Berman, Robin E.; and Hurwitch, Carl B., 5,151,744, Cl. 355-296.000.
Miller, Gregory P., 5,150,865, Cl. 248-71.000.
Paoli, Thomas L., 5,151,915, Cl. 372-50.000.
Seyfried, Joseph A.; and Patel, Chetan G., 5,150,807, Cl. 220-359.000.

Yacubowicz, Henia: *See—*
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Yagi, Soichi: *See—*
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Yaguchi, Masanori, to Fujitsu Limited. Image forming apparatus having flash light fixing apparatus with improved heat characteristics. 5,151,743, Cl. 355-288.000.

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Kotake, Katuo; Kitahama, Michihiro; Otaki, Keizaburo; Miyazaki, Akira; Abe, Masayuki; Okahara, Shoji; Tuchida, Manabu; Yaguchi, Yukihiro; Furuya, Hiroyuki; and Nakamura, Takeshi, 5,150,506, Cl. 29-407.000.

Yajima, Makoto: *See—*
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Yajima, Ryoichi: *See—*
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Yakou, Takeshi, to Canon Kabushiki Kaisha. Work pickup apparatus. 5,150,937, Cl. 294-119.100.

Yakushiji, Yasuhiro: *See—*
Kasahara, Yasuhiro; Suzuki, Hiroshi; Yakushiji, Yasuhiro; Ito, Shoichi; and Suzuka, Takashi, 5,151,696, Cl. 341-22.000.

Yamada, Minoru; and Toyoda, Takashi, to Fuji Photo Film Co., Ltd. Processing solution replenishment. 5,151,731, Cl. 354-324.000.

Yamada, Tamotsu: *See—*
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Yamada, Toshio; and Inoue, Michihiro, to Matsushita Electric Industrial Co., Ltd. Semiconductor memory device. 5,151,878, Cl. 365-189.010.

Yamada, Toshiyuki; Takahama, Yoshihiro; Kurihara, Kazushige; and Nakajima, Hajime, to Shimizu Construction Co. Chord truss roof structure. 5,150,556, Cl. 52-639.000.

Yamada, Yasutoshi: *See—*
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Yamada, Yoshikado: *See—*
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Yamagami, Hiroyuki: *See*—
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Yamagishi, Mamio, to Hitachi, Ltd. Intersystem data base sharing journal merge method. 5,151,988, Cl. 395-600.000.
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Yamaguchi, Hiroshi: *See*—
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Yamaguchi, Yasuyoshi, to Tokyo Electric Co., Ltd. Fixing device sheet guide apparatus. 5,151,742, Cl. 355-285.000.
Yamaha Corporation: *See*—
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Kobayashi, Noboru, 5,150,663, Cl. 116-209.000.
Kobayashi, Noboru; and Futaki, Yoshiki, 5,151,057, Cl. 440-38.000.
Yamahata, Hitoshi, to NEC Corporation. Data processor performing operation on data having length shorter than one-word length. 5,151,993, Cl. 395-775.000.
Yamamoto, Akio. Rail support adjusting and fastening device. 5,150,835, Cl. 238-50.000.
Yamamoto, Hideaki; Seki, Koichi; Tanaka, Toshihiro; Sasano, Akira; Tsukada, Toshihisa; Shimomoto, Yasuharu; Nakano, Toshio; and Kanamori, Hideto, to Hitachi, Ltd. Method of manufacturing a metallic silicide transparent electrode. 5,151,385, Cl. 437-181.000.
Yamamoto, Hiroshi; and Hanato, Mitsuhiro, to Fuji Kikai Kogyo Kabushiki Kaisha; and Dainippon Ink and Chemicals, Inc. Device for pushing printing material for use in a printing apparatus. 5,150,652, Cl. 101-232.000.
Yamamoto, Ichiro: *See*—
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Yamamoto, Masanobu; and Itoh, Kazumine, to Sony Corporation. Method and apparatus for producing three-dimensional objects. 5,151,813, Cl. 359-202.000.
Yamamura, Souhei, to Matsushita Electric Industrial Co., Ltd. Headrest and mobile body equipped with same. 5,151,944, Cl. 381-151.000.
Yamanaka, Motosuke: *See*—
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Yamanashi, Hidenori, to Mitsubishi Corporation; and Yazaki Corporation. Method of producing bromine-treated graphite fibers. 5,151,261, Cl. 423-448.000.
Yamanashi, Yasuhiro: *See*—
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Yamasaki, Koji, to NEC Corporation. Speaker driver. 5,151,680, Cl. 340-384.00E.
Yamasaki, Koji, to NEC Corporation. Paging receiver capable of preventing unauthorized access to message meant therefor. 5,151,694, Cl. 340-825.440.
Yamasaki, Yukihiro; Suetsugu, Toshio; Matsuo, Tamotsu; and Okamura, Hideo, to Matsushita Electric Industrial Co., Ltd. Optical data recording and reproducing apparatus. 5,151,893, Cl. 369-116.000.
Yamashita, Hiroki; and Emori, Kiyoshi, to Minolta Camera Kabushiki Kaisha. Sheet storing apparatus with a plurality of trays. 5,151,735, Cl. 355-207.000.
Yamashita, Mitugu; Kawamoto, Mutsumi; and Inagaki, Hidemitsu, to Aisin AW Co., Ltd. Wiring and piping arrangement for a vehicle motor. 5,150,763, Cl. 180-252.000.
Yamashita, Yoshiro: *See*—
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Yamauchi, Hiroshi: *See*—
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Yamauchi, Tunenori, to Fujitsu Limited. Semiconductor device comprising high-speed and high-current transistors formed in a common substrate and having matched characteristics. 5,151,765, Cl. 357-34.000.
Yamazaki, Akira; Kumanoya, Masaki; Konishi, Yasuhiro; and Dosaka, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Circuit having charge compensation and an operation method of the same. 5,151,614, Cl. 307-272.300.
Yamazaki, Atsushi, to NEC Corporation. Buffer control circuit for data processor. 5,151,980, Cl. 395-375.000.
Yamazaki, Etsuo: *See*—
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Yamazaki, Katsunori, to Seiko Epson Corporation. Method and apparatus for driving a liquid crystal display panel. 5,151,690, Cl. 340-784.000.
Yamazaki, Shiro: *See*—
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Yamazaki, Shunpei; and Sato, Masahiko, to Semiconductor Energy Laboratory Co., Ltd. Chiral smectic liquid crystal electro-optical device having domains for alignment smaller than a pixel. 5,151,808, Cl. 359-78.000.
Yanagihara, Tsuyoshi: *See*—
Motohashi, Toshiaki; Harada, Yooichi; and Yanagihara, Tsuyoshi, 5,150,742, Cl. 141-59.000.
Yanagisawa, Shuichi; Sakai, Tatsuro; Murata, Yasushi; Matsui, Fumio; and Mitoh, Yasuo, to Pioneer Electronic Corporation; and Nitto Denko Corporation. Information recording medium. 5,151,310, Cl. 428-64.000.
Yanagita, Tomoatsu: *See*—
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Yanase, Nobuyuki: *See*—
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Yang, Lau S., to Arco Chemical Technology, L.P. Miscible polyblends of acid-and anhydride-containing copolymers. 5,151,464, Cl. 524-449.000.
Yano, Hirofumi; and Yokoi, Seiji, to Nissan Motor Co., Ltd. Fuel tank vapor control system with means for warning of malfunction of canister. 5,150,689, Cl. 123-519.000.
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Kaji, Shinichi; Yano, Kazuyuki; Shibata, Yoshitaka; Takahashi, Toshihiro; Takamaru, Kiyomi; Tobita, Hideyuki; and Hiyama, Isao, 5,150,489, Cl. 8-159.000.
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Yasumoto, Hiroshige: *See*—
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Yates, John B., III; Pratt, Charles F.; and McHale, Angelika H., to General Electric Co. Olefinic impact modifiers for compatible blends of polyphenylene ethers and linear polyester resins. 5,151,460, Cl. 524-291.000.
Yazaki Corporation: *See*—
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Yokomatsu, Takahiro; Mine, Kenji; and Kato, Shinichiro, to Bridgestone Flowtech Corporation. Hose fitting. 5,150,924, Cl. 285-101.000.
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Yokono, Shigeru; and Tobita, Minoru, to Sony Corporation. Data recording method. 5,151,905, Cl. 371-39.100.
Yokosuka, Toshie, to Kimoto Co., Ltd. Masking material. 5,151,336, Cl. 430-7.000.
Yokoyama, Kazumasa: *See*—
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Yokoyama, Naoki; and Imamura, Kenichi, to Fujitsu Limited. Resonant-tunneling heterojunction bipolar transistor device. 5,151,618, Cl. 307-471.000.
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Yonekubo, Masatoshi, to Seiko Epson Corporation. Optical system for optical memory device. 5,151,890, Cl. 369-44.110.
Yoo, Taek J.; Jang, Yong N.; Oh, Wook H.; and Jeong, Chan S., to SKC Limited. Method for cleaning filter disks and system therefor. 5,151,186, Cl. 210-541.000.
Yoppolo, Robert A.: *See*—
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York Products Inc.: *See*—
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Yoshida, Masaru: *See*—
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Yoshida, Noriyuki: *See*—
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Yoshida, Suguru; Tsunoda, Isao; and Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Joint structure for sandwiched structural body. 5,150,944, Cl. 296-203.000.
Yoshida, Tsuyoshi: *See*—
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Yoshii, Makoto: *See*—
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Yoshikawa, Junichi, to Canon Kabushiki Kaisha. Recording apparatus with detector for paper edge and end of ribbon sensing. 5,150,977, Cl. 400-703.000.
Yoshikawa, Takao; and Masuda, Isao, to Sony Corporation. Video signal reproducing apparatus with means for producing a crosstalk eliminated luminance output signal. 5,151,792, Cl. 358-327.000.
Yoshikawa, Toshiyuki: *See*—
Otsuka, Saburo; Ito, Yuusuke; Yoshikawa, Toshiyuki; and Tokuda, Shoichi, 5,151,271, Cl. 424-443.000.
Yoshimitsu, Koichi: *See*—
Miyanaga, Hirofumi; Sakamoto, Nobuyuki; Yoshimitsu, Koichi; and Tanaka, Yasundo, 5,150,702, Cl. 128-6.000.
Yoshino, Ryutaro; Gomi, Hiroshi; Nishikawa, Masao; and Hirose, Masato, to Honda Giken Kogyo Kabushiki Kaisha. Legged walking robot and system for controlling the same. 5,151,859, Cl. 364-424.020.
Yoshioka, Hiroshi: *See*—
Sato, Hiroshi; and Yoshioka, Hiroshi, 5,151,547, Cl. 560-205.000.
Yoshioka, Kazumi: *See*—
Kawahara, Katsumi; Uchida, Masami; Yoshioka, Kazumi; Ohta, Takeo; and Horai, Keiichiro, 5,151,295, Cl. 427-12.000.
Yoshizawa, Yoshihito; Bizen, Yoshio; Yamauchi, Kiyotaka; Nishiyama, Toshikazu; and Suwabe, Shigekazu, to Hitachi Metals Ltd. Soft magnetic alloy with ultrafine crystal grains and method of producing same. 5,151,137, Cl. 148-313.000.
Yoshotomi Pharmaceutical Industries, Ltd.: *See*—
Uchida, Itsuo; Saito, Akira; Yasuda, Akihiro; Iwata, Kunio; Hari, Hiroaki; Hara, Katsuyoshi; Matsushita, Mutsuyoshi; Anami, Koretake; Haruta, Junichi; and Furukawa, Noboru, 5,151,497, Cl. 530-331.000.
Yotsumoto, Toshihiro: *See*—
Imai, Isamu; Yotsumoto, Toshihiro; Inada, Norio; Toki, Shigeyuki; Sato, Maki; and Wada, Ichiro, 5,151,142, Cl. 152-565.000.
You, Young S.; and Meyer, John D., to Hewlett-Packard Company. Solid ink compositions for thermal ink-jet printing having improved printing characteristics. 5,151,120, Cl. 106-27.000.
Young, Manley A., to Boeing Company, The. Air vehicle launching device. 5,150,860, Cl. 244-63.000.
Young, Michael J. R.; and Bradnock, Brian R. D. Tool for removal of plastics material. 5,151,099, Cl. 606-27.000.
Young, Patrick, to Insight Telecast, Inc. System and method for automatic, unattended recording of cable television programs. 5,151,789, Cl. 358-194.100.
Younger, George G. Apparatus for logging electronic media-taped material. 5,151,687, Cl. 340-706.000.
Yu, Frank I.: *See*—
Shenoi, Kishan; Hanagan, Patrick L.; Ho, Helena S.; and Yu, Frank I., 5,151,901, Cl. 370-110.100.
Yuan, Gu F.; Yuen, Kou M.; Wei, Zhao Q.; and Ying, Gu Z., to Neng-Shi (Hong Kong) Industrial Co. Multifunctional tool. 5,150,488, Cl. 7-137.000.
Yuasa, Toshiya: *See*—
Arahara, Kohzoh; Yuasa, Toshiya; Kai, Takashi; Tohyama, Noboru; Mouri, Akihiro; and Matsumoto, Kenichi, 5,151,712, Cl. 346-1.100.
Yuen, Kou M.: *See*—
Yuan, Gu F.; Yuen, Kou M.; Wei, Zhao Q.; and Ying, Gu Z., 5,150,488, Cl. 7-137.000.
Yuki, Syoji; Tokui, Yasuyuki; Nishiuchi, Kihachiro; Wada, Kenichi; Suzue, Masayoshi; and Morimoto, Takuo, to Asics Corporation; and Otsuka Chemical Company, Limited. Rubber composition and golf ball comprising it. 5,150,905, Cl. 273-218.000.
Yum, Su I.: *See*—
Theeuwes, Felix; and Yum, Su I., 5,151,093, Cl. 604-892.100.
Yumoto, Atsushi: *See*—
Uchida, Takayuki; Ide, Satoshi; Yamamoto, Masahiro; and Yumoto, Atsushi, 5,150,598, Cl. 72-325.000.
Yun, Chung J., to Crown Cork & Seal Company, Inc. Filling valve. 5,150,740, Cl. 141-6.000.
Yutori, Toshiaki; and Kanetsuki, Yutaka, to Kabushiki Kaisha Kobe Seiko Sho. Inspection probe having thin metal wires with self resiliency. 5,151,653, Cl. 324-158.00P.
Zabinski, Thomas E.: *See*—
Hales, Crispin; and Zabinski, Thomas E., 5,151,303, Cl. 427-178.000.
Zaha, Juergen H.: *See*—
Best, Robert J.; Larkin, Mark E.; and Zaha, Juergen H., 5,151,090, Cl. 604-192.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Mann, Egon; Eymuller, Helmut; and Stutzle, Siegfried, 5,151,068, Cl. 475-322.000.
Zak, Henry C.: *See*—
Bell, Jack H.; Zak, Henry C.; and De Santis, Dominick A., 5,151,212, Cl. 252-186.380.
Zamb, Tim: *See*—
Babiuk, Lorne; van den Hurk, Sylvia; Zamb, Tim; and Fitzpatrick, David, 5,151,267, Cl. 424-89.000.
Zaoralek, Heinz-Michael, to Schwabische Huttenwerke GmbH. Roll having heating means. 5,151,576, Cl. 219-469.000.
Zappella, Pierino I., to Rockwell International Corporation. Method for dicing semiconductor substrates using an excimer laser beam. 5,151,389, Cl. 437-226.000.
Zarabadi, Seyed R.; El-Naggar, Mohammed I.; and Khachab, Nabil I., to Ohio State University, The. High frequency BiMOS linear V-I converter, voltage multiplier, mixer. 5,151,625, Cl. 307-529.000.
Zeindl, Gerhard: *See*—
Schweitzer, Karl; and Zeindl, Gerhard, 5,150,530, Cl. 33-626.000.
Zenith Electronics Corporation: *See*—
Citta, Richard W., 5,151,785, Cl. 358-141.000.
Zenon Environmental, Inc.: *See*—
Behmann, Henry, 5,151,187, Cl. 210-607.000.
Zeuschner, Ulrich: *See*—
Arndt, Ulrich; Luneburg, Peter; Marquardt, Kurt; Pierags, Hans-Joachim; and Zeuschner, Ulrich, 5,151,280, Cl 425-186.000.
Zexel Corporation: *See*—
Tanaka, Ichiro; Sasaki, Seiji; Kakubari, Zen-ichi; and Kojima, Osamu, 5,151,063, Cl. 454-258.000.
Zey, Edward G.; Shockley, Thomas H.; Ryan, Debra A.; and Moss, Gary L., to Hoechst Celanese Corporation. Method for purification of ibuprofen comprising mixtures. 5,151,551, Cl. 562-494.000.
Zhao, Chen: *See*—
Sham, Hing L.; Norbeck, Daniel W.; Kempf, Dale J.; and Zhao, Chen, 5,151,438, Cl. 514-357.000.
Ziemecki, Stanislaw B., to Du Pont de Nemours, E. I., and Company. Selective low pressure hydrogenation of a dinitrile to an aminonitrile. 5,151,543, Cl. 558-459.000.
Zimmer, Johannes. Arrangement for applying substances to a web of material. 5,151,132, Cl. 118-126.000.
Zimmerman, Jeffrey M.: *See*—
Gubanc, David M.; Liston, Larry J.; and Zimmerman, Jeffrey M., 5,151,258, Cl. 423-235.000.
Zorn, Bruno: *See*—
Noll, Klaus; Pedain, Josef; Zorn, Bruno; and Schmid, Rosemarie, 5,151,329, Cl. 428-423.400.
Zorzi, Claudio: *See*—
Tacchetto, Maurizio; Zorzi, Claudio; De Bortoli, Giuseppe; Pozzobon, Alessandro; and Serafin, Renato, 5,150,537, Cl. 36-50.500.
Zschoche, Robert A., to Paulson, Eric W. Universal aircraft nosewheel cradle and tug assembly. 5,151,003, Cl. 414-428.000.
Zwikstra, Nico, to Van den Bergh Foods Co., Division of Conopco Inc. Fatblend and process of producing. 5,151,292, Cl. 426-601.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF SEPTEMBER, 1992

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Burndy Corporation: *See*—
Noschese, Rocco J., Re. 34,084, Cl. 439-66.000.

Canon Kabushiki Kaisha: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, Re. 34,083, Cl. 354-173.110.

Chasteen, Ronald E.: *See*—
Gatza, Ward K.; and Chasteen, Ronald E., Re. 34,079, Cl. 123-632.000.

Gatza, Ward K.; and Chasteen, Ronald E., to Pacer Industries Inc. Method and apparatus for conserving battery power in a snowmobile electrical system. Re. 34,079, Cl. 123-632.000.

Greene, Leonard M., to Safe Flight Instrument Corporation. Variable threshold wind shear warning system. Re. 34,082, Cl. 340-968.000.

Harada, Yoshihito: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, Re. 34,083, Cl. 354-173.110.

Hesseltine, Dennis R. Method and means for measuring plate structures. Re. 34,078, Cl. 33-803.000.

Imperial Chemical Industries: *See*—
Rose, John B.; and Staniland, Philip A., Re. 34,085, Cl. 528-125.000.

Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, to Canon Kabushiki Kaisha. Camera with motorized film rewinding device. Re. 34,083, Cl. 354-173.110.

Kobayashi, Ryuichi: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, Re. 34,083, Cl. 354-173.110.

Lucero, James L. Drive-through credit card payment device. Re. 34,081, Cl. 235-381.000.

New Tek Manufacturing, Inc.: *See*—
Schmidt, Eugene H., Re. 34,080, Cl. 172-5.000.

Noschese, Rocco J., to Burndy Corporation. Vertical action contact spring. Re. 34,084, Cl. 439-66.000.

Ohara, Tsunemasa: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, Re. 34,083, Cl. 354-173.110.

Pacer Industries Inc.: *See*—
Gatza, Ward K.; and Chasteen, Ronald E., Re. 34,079, Cl. 123-632.000.

Rose, John B.; and Staniland, Philip A., to Imperial Chemical Industries. Thermoplastic aromatic polyetherketones. Re. 34,085, Cl. 528-125.000.

Safe Flight Instrument Corporation: *See*—
Greene, Leonard M., Re. 34,082, Cl. 340-968.000.

Schmidt, Eugene H., to New Tek Manufacturing, Inc. Row following guidance device for a tractor-drawn row crop implement. Re. 34,080, Cl. 172-5.000.

Staniland, Philip A.: *See*—
Rose, John B.; and Staniland, Philip A., Re. 34,085, Cl. 528-125.000.

Suzuki, Masayuki: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, Re. 34,083, Cl. 354-173.110.

Tosaka, Yoichi: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, Re. 34,083, Cl. 354-173.110.

LIST OF DESIGN PATENTEES

Ackley, Robert; Wells, Stanleigh; Beehner, Robert; and Dokoupil, James, to Croydon Company, Inc., The. Hanger bar display stand. 329,765, 9-29-92, Cl. D6-465.000.

Adcock, Bob E.; and Laird, Edwin C. Sandal. 329,731, 9-29-92, Cl. D2-270.000.

Addison, F. Clark; and Thorstensen, Peder J. Dispenser for rolled material. 329,773, 9-29-92, Cl. D6-520.000.

Agnew, James: *See*—
Byrne, Robert; and Agnew, James, 329,736, Cl. D2-314.000.
Byrne, Robert; and Agnew, James, 329,742, Cl. D2-320.000.

Alden Corporation: *See*—
Polonsky, Eli, 329,786, Cl. D8-14.000.

Allibert S.A.: *See*—
Hubert, Manfred, 329,772, Cl. D6-502.000.

Allsop, Michael J.: *See*—
Booth, Anthony; Piano, Anthony; Woodrum, Byron; Allsop, Michael J.; Berger, Robert L.; and Hyman, Richard M., Sr., 329,751, Cl. D4-104.000.

Ancona, Bruce; and Ancona, Jane, to M. Kamenstein, Inc. Storage unit for tools. 329,766, 9-29-92, Cl. D6-467.000.

Ancona, Bruce; and Ancona, Jane, to M. Kamenstein, Inc. Holder for a grater or the like. 329,783, 9-29-92, Cl. D7-641.000.

Ancona, Jane: *See*—
Ancona, Bruce; and Ancona, Jane, 329,766, Cl. D6-467.000.
Ancona, Bruce; and Ancona, Jane, 329,783, Cl. D7-641.000.

Andersson, Karl A.; and Ferm, Morgan, to Etac AB. Walker. 329,833, 9-29-92, Cl. D12-130.000.

Andrew, Peter. Combination wrench for lock nuts. 329,788, 9-29-92, Cl. D8-17.000.

Anna Young Associates, Ltd.: *See*—
Lombardi, Carl M., Jr., 329,924, Cl. D28-77.000.

Antonious, Anthony J. Iron golf club head. 329,905, 9-29-92, Cl. D21-220.000.

Apps, William P., to Rehrig-Pacific Company, Inc. Outer wall structure for a nestable tray. 329,931, 9-29-92, Cl. D34-40.000.

Apps, William P., to Rehrig Pacific Company, Inc. Outer wall structure for a nestable tray. 329,932, 9-29-92, Cl. D34-40.000.

Art Deco, Inc.: *See*—
Cuminale, Raymond J., 329,763, Cl. D6-429.000.

Asics Corporation: *See*—
Kiyosawa, Junichi; and Ujishima, Toshikazu, 329,740, Cl. D2-320.000.
Kiyosawa, Junichi, 329,741, Cl. D2-320.000.

Avia Group International, Inc.: *See*—
Dahlsten, Janelle, 329,735, Cl. D2-314.000.

Baker, John M. Knife sharpener. 329,797, 9-29-92, Cl. D8-93.000.

Ban, Yutaka: *See*—
Sakaguchi, Eiji; and Ban, Yutaka, 329,868, Cl. D18-43.000.

Bartlett, Laurence; and Cowan, John, to Edlund Company, Inc. Can opener. 329,789, 9-29-92, Cl. D8-33.000.

Beaver, Theodore L.; Pinson, Diane J.; and Wissman, Craig A., to Clorox Company, The. Bottle. 329,815, 9-29-92, Cl. D9-528.000.

Beaver, Theodore L.; Pinson, Diane J.; and Wissman, Craig A., to Clorox Company, The. Bottle. 329,816, 9-29-92, Cl. D9-528.000.

Bedoyan, Krikor, to Oroamerica, Inc. Jewelry chain. 329,828, 9-29-92, Cl. D11-13.000.

Beehner, Robert: *See*—
Ackley, Robert; Wells, Stanleigh; Beehner, Robert; and Dokoupil, James, 329,765, Cl. D6-465.000.

Benghozi, Simon V. Ceiling lamp. 329,921, 9-29-92, Cl. D26-88.000.

Bennett, Jimmy J.: *See*—
Bird, Samuel K.; and Bennett, Jimmy J., 329,795, Cl. D8-70.000.

Berger, Robert L.: *See*—
Booth, Anthony; Piano, Anthony; Woodrum, Byron; Allsop, Michael J.; Berger, Robert L.; and Hyman, Richard M., Sr., 329,751, Cl. D4-104.000.

Berger, Robert P. Combined dental mold and base. 329,900, 9-29-92, Cl. D24-181.000.

Best, Philip C., to Procter & Gamble Company, The. Bottle. 329,817, 9-29-92, Cl. D9-556.000.

Bird, Samuel K.; and Bennett, Jimmy J. Wire connector driver. 329,795, 9-29-92, Cl. D8-70.000.

Bloomfield, John I., to Plastic Consulting and Design Limited. Tamper-proof cap. 329,809, 9-29-92, Cl. D9-443.000.

Booth, Anthony; Piano, Anthony; Woodrum, Byron; Allsop, Michael J.; Berger, Robert L.; and Hyman, Richard M., Sr., to Warner-Lambert Company. Toothbrush head and handle unit. 329,751, 9-29-92, Cl. D4-104.000.

Bottcher, Thomas D.; and Bratton, William E., to International Business Machines Corporation. Automotive diagnostic system. 329,819, 9-29-92, Cl. D10-75.000.

Bratton, William E.: *See—*
Bottcher, Thomas D.; and Bratton, William E., 329,819, Cl. D10-75.000.

Breen, John D., to Rubbermaid Incorporated. Compartmented organizer for office supplies. 329,876, 9-29-92, Cl. D19-75.000.

Brister, Richard C. Liquid dispenser for adding skin toner to shower water. 329,892, 9-29-92, Cl. D23-228.000.

Brown, Paul D.: *See—*
Miller, David E.; Brown, Paul D.; Jones, Andrew R.; and Cohen, Eric D., 329,733, Cl. D2-314.000.
Preskar, David J.; and Brown, Paul D., 329,734, Cl. D2-314.000.

Brunner, Merlin A.; and Draheim, Harvey J., to Simmons Juvenile Products Company, Inc. Crib endboard. 329,774, 9-29-92, Cl. D6-508.000.

Byrne, Robert; and Agnew, James, to L.A. Gear, Inc. Shoe upper. 329,736, 9-29-92, Cl. D2-314.000.

Byrne, Robert; and Agnew, James, to L.A. Gear, Inc. Shoe sole. 329,742, 9-29-92, Cl. D2-320.000.

Canon Kabushiki Kaisha: *See—*
Sakaguchi, Eiji; and Ban, Yutaka, 329,868, Cl. D18-43.000.
Suzuki, Noriyuki, 329,869, Cl. D18-49.000.
Umino, Toshio; and Kuwabara, Nobuyuki, 329,871, Cl. D18-56.000.

Carlson, Bruce W.; Knoblock, Cindy L.; and Michel, Scott E., to Minnesota Mining and Manufacturing Company. Pad of paper. 329,872, 9-29-92, Cl. D19-26.000.

Chambless, William F. Pulling handle unit for attachment to the handlebars of a tricycle or the like. 329,831, 9-29-92, Cl. D12-114.000.

Chen, Chieh-Ju. Vending machine or similar article. 329,878, 9-29-92, Cl. D20-3.000.

Chen, Evan N.; and Ferraro, Frank A., to Warner-Lambert Company. Flexible razor cartridge. 329,922, 9-29-92, Cl. D28-47.000.

Chen, Helen. Culinary scissors. 329,792, 9-29-92, Cl. D8-57.000.

Chern, Gwo-Hwa. Sliding block game. 329,879, 9-29-92, Cl. D21-14.000.

Chi, William H. N. Stapler. 329,790, 9-29-92, Cl. D8-50.000.

Chi, William H. N. Stapler. 329,791, 9-29-92, Cl. D8-50.000.

Christian Brothers, Inc.: *See—*
Christian, William D., 329,888, Cl. D21-211.000.

Christian, William D., to Christian Brothers, Inc. Hockey stick. 329,888, 9-29-92, Cl. D21-211.000.

Chuang Tao Corporation: *See—*
Tu, Charlie, 329,873, Cl. D19-48.000.

Chumsae, Mark S., to Coppus Engineering Corporation. Duct canister for carrying and storing sections of a flexible duct used with portable ventilators. 329,895, 9-29-92, Cl. D23-393.000.

Cimagiochi S.r.l.: *See—*
Cimasa, Alfonso, 329,880, Cl. D21-74.000.

Cimasa, Alfonso, to Cimagiochi S.r.l. Coin-operated amusement ride. 329,880, 9-29-92, Cl. D21-74.000.

Clarke, Eugene J.; Riemer, Joseph H.; Feen, Stuart H.; and Smith, Charles R., to Stewart Warner Alemite Corporation. Bottle. 329,812, 9-29-92, Cl. D9-523.000.

Clorox Company, The: *See—*
Beaver, Theodore L.; Pinson, Diane J.; and Wissman, Craig A., 329,815, Cl. D9-528.000.
Beaver, Theodore L.; Pinson, Diane J.; and Wissman, Craig A., 329,816, Cl. D9-528.000.

Coca-Cola Company, The: *See—*
Richter, Simon J.; and Hohmann, Frank G., 329,813, Cl. D9-524.000.

Cohen, Eric D.: *See—*
Miller, David E.; Brown, Paul D.; Jones, Andrew R.; and Cohen, Eric D., 329,733, Cl. D2-314.000.

Collins, Virgil: *See—*
Mangino, Rudolfo; Mangino, Rudolfo, Jr.; and Collins, Virgil, 329,829, Cl. D12-15.000.

Colonello, Alexander. Sand rake head. 329,785, 9-29-92, Cl. D8-13.000.

Combi Corporation: *See—*
Ishikura, Takashi; and Nakamata, Tatsuo, 329,832, Cl. D12-129.000.

Conklin, Eva C. Portable swinging door lock. 329,799, 9-29-92, Cl. D8-331.000.

Connolly, Kevin J.; D'Aleo, James M.; and Griffith, Clifford J., to Garden Way Incorporated. Tamping tool for a chipper/shredder. 329,787, 9-29-92, Cl. D8-14.000.

Contico International, Inc.: *See—*
Foster, Donald D.; and Wolff, Douglas F., 329,802, Cl. D9-300.000.

Cooper, Michael: *See—*
Easterling, Jimmy W.; and Cooper, Michael, 329,778, Cl. D7-323.000.

Copeland, Stephan, to Flos S.p.A. Table lamp. 329,916, 9-29-92, Cl. D26-63.000.

Coppus Engineering Corporation: *See—*
Chumsae, Mark S., 329,895, Cl. D23-393.000.

Cowan, John: *See—*
Bartlett, Laurence; and Cowan, John, 329,789, Cl. D8-33.000.

Coyle, Robert E. Visor. 329,729, 9-29-92, Cl. D2-248.000.

Coyle, Robert E. Visor. 329,730, 9-29-92, Cl. D2-248.000.

Craig, Michael P. Underwater platform. 329,903, 9-29-92, Cl. D25-62.000.

Croydon Company, Inc., The: *See—*
Ackley, Robert; Wells, Stanleigh; Beehner, Robert; and Dokoupil, James, 329,765, Cl. D6-465.000.

Cuadrado, Manuel. Pen. 329,874, 9-29-92, Cl. D19-48.000.

Cuminale, Raymond J., to Art Deco, Inc. Jewelry display stand. 329,763, 9-29-92, Cl. D6-429.000.

Dahlsten, Janelle, to Avia Group International, Inc. Shoe upper. 329,735, 9-29-92, Cl. D2-314.000.

Daiwa Seiko, Inc.: *See—*
Oyama, Mitsuyoshi, 329,909, Cl. D22-142.000.

D'Aleo, James M.: *See—*
Connolly, Kevin J.; D'Aleo, James M.; and Griffith, Clifford J., 329,787, Cl. D8-14.000.

Dean, Michael R. Multi-purpose storage rack for mounting above the engine on a boat. 329,838, 9-29-92, Cl. D12-318.000.

Dearwester, Donald D., to Procter & Gamble Company, The. Combined package with paper rolls. 329,804, 9-29-92, Cl. D9-341.000.

Delafield, Frederick. Cheval mirror. 329,753, 9-29-92, Cl. D6-311.000.

Dell USA, L.P.: *See—*
Haner, Richard V., 329,846, Cl. D14-100.000.

Delmerico, Paul E.; and Terek, Greg P., to Rubbermaid Commercial Products-Inc. Refuse container with lid. 329,930, 9-29-92, Cl. D34-7.000.

Denz Design: *See—*
Greutmann, Urs; and Greutmann, Carmen, 329,760, Cl. D6-397.000.

Dieperink, Menno; and Joosten, Stefanus F. W., to U.S. Philips Corporation. Wall mounted luminaire. 329,920, 9-29-92, Cl. D26-87.000.

Digital Equipment Corporation: *See—*
Hetfield, Margaret L.; and Koepke, Marcus, 329,847, Cl. D14-113.000.

Dokoupil, James: *See—*
Ackley, Robert; Wells, Stanleigh; Beehner, Robert; and Dokoupil, James, 329,765, Cl. D6-465.000.

Draheim, Harvey J.: *See—*
Brunner, Merlin A.; and Draheim, Harvey J., 329,774, Cl. D6-508.000.

Dunlop Slazenger Corporation: *See—*
Gorman, Geoffrey W., 329,904, Cl. D21-220.000.

Dutcher, Robert G.; and Hill, John C. Myocardial lead introducer. 329,898, 9-29-92, Cl. D24-133.000.

E & B Giftware, Inc.: *See—*
Hollinger, Fred, 329,827, Cl. D11-160.000.

E. Remy Martin & Cie, S.A.: *See—*
Giraud, Jean-Pierre, 329,808, Cl. D9-415.000.

Easterling, Jimmy W.; and Cooper, Michael, to Wayne Industries, Inc. Pizza warmer. 329,778, 9-29-92, Cl. D7-323.000.

Edlund Company, Inc.: *See—*
Bartlett, Laurence; and Cowan, John, 329,789, Cl. D8-33.000.

Ehlin, Thomas O. Belt attachable tool holder. 329,748, 9-29-92, Cl. D3-105.000.

Ehrhart, Michel, to Hohner Automation Societe Anonyme. Incremental coder. 329,839, 9-29-92, Cl. D13-118.000.

Elliot, Brian, to Nike, Inc.; and Nike International, Ltd. Shoe upper. 329,737, 9-29-92, Cl. D2-314.000.

Embree, Donald, to Rubbermaid Incorporated. Storage locker. 329,747, 9-29-92, Cl. D3-78.000.

Emhart Inc.: *See—*
Yost, Holly K., 329,911, Cl. D23-250.000.

Etac AB: *See—*
Andersson, Karl A.; and Ferm, Morgan, 329,833, Cl. D12-130.000.

Evans, David, to Tucker Housewares, Inc. Shoe rack. 329,764, 9-29-92, Cl. D6-462.000.

Feen, Stuart H.: *See—*
Clarke, Eugene J.; Riemer, Joseph H.; Feen, Stuart H.; and Smith, Charles R., 329,812, Cl. D9-523.000.

Ferm, Morgan: *See—*
Andersson, Karl A.; and Ferm, Morgan, 329,833, Cl. D12-130.000.

Ferraro, Frank A.: *See—*
Chen, Evan N.; and Ferraro, Frank A., 329,922, Cl. D28-47.000.

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Francisco, Juan, to See See, Inc. Illuminable walking cane. 329,822, 9-29-92, Cl. D10-104.000.

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Fujitani, Takashi, to Kabushiki Kaisha Gakushu Kenkyusha. Air cushion boat toy. 329,886, 9-29-92, Cl. D21-130.000.

Fukuda, Kenji, to Nitto Kohki Co., Ltd. Pipe cutter. 329,793, 9-29-92, Cl. D8-60.000.

G. I. Supply, Inc.: *See—*
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Galerne, Jean. Arc lamp for motion picture photography. 329,917, 9-29-92, Cl. D26-63.000.

Gandy, Paul J., to MUPI Children Products Inc. Combined desk and bench unit. 329,756, 9-29-92, Cl. D6-338.000.

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Garden Way Incorporated: *See—*
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Gerry Baby Products Company: *See—*
Knoedler, Roy E.; Samson, Jeffery T.; and Freese, T. Brent, 329,929, Cl. D32-37.000.

Gilmore, John A.; and Gilmore, Leslie C. Pager carrying case. 329,750, 9-29-92, Cl. D3-106.000.

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Gilmore, John A.; and Gilmore, Leslie C., 329,750, Cl. D3-106.000.

Girardin, Jean-Marc. Bus. 329,830, 9-29-92, Cl. D12-84.000.

Giraud, Jean-Pierre, to E. Remy Martin & Cie, S.A. Bottle package. 329,808, 9-29-92, Cl. D9-415.000.

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Gorman, Geoffrey W., to Dunlop Slazenger Corporation. Golf club iron. 329,904, 9-29-92, Cl. D21-220.000.

Gouldson, Stanley F.; and Marshall, David, to Plasti-form Enterprises, Inc. Garment hanger. 329,754, 9-29-92, Cl. D6-326.000.

Gouldson, Stanley F., to Plasti-form Enterprises, Inc. Garment hanger. 329,755, 9-29-92, Cl. D6-326.000.

Graham, Michael, to Thor Tools Limited. Drill. 329,794, 9-29-92, Cl. D8-68.000.

Grahl, Fredrich W.; and Litewka, Jack, to Grahl Industries, Inc. Armrest for a chair. 329,770, 9-29-92, Cl. D6-501.000.

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Gustafsson, Lars-Erik; and Pettersson, Lars T., to Sandvik AB. Cutoff insert. 329,859, 9-29-92, Cl. D15-139.000.

Gutierrez, Patrick. Patio block. 329,915, 9-29-92, Cl. D25-151.000.

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Haner, Richard V., to Dell USA, L.P. Computer. 329,846, 9-29-92, Cl. D14-100.000.

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Harriott, Joel M. Guitar body. 329,865, 9-29-92, Cl. D17-20.000.

Harriott, Joel M. Guitar body. 329,866, 9-29-92, Cl. D17-20.000.

Harrison, Andrew J., deceased: *See—*
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Hatfield, Tinker L., to Nike, Inc. Shoe midsole. 329,739, 9-29-92, Cl. D2-318.000.

Heider, James E. Container carrier. 329,807, 9-29-92, Cl. D9-344.000.

Heisick, Keith D. Ski bag. 329,743, 9-29-92, Cl. D3-36.000.

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Hoerz, Erich, to Helmut Leismann OHG. Combined set of musical instruments and support therefor. 329,867, 9-29-92, Cl. D17-22.000.

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Horikiri, Kazuhisa; and Isozaki, Makoto, to Fuji Photo Film Co., Ltd. Audio tape cassette. 329,855, 9-29-92, Cl. D14-121.000.

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Hubert, Manfred, to Allibert S.A. Openwork design for seat backs. 329,772, 9-29-92, Cl. D6-502.000.

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Rasmussen, Erik H., 329,883, Cl. D21-108.000.
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Ishida, Katsuhiro, to Sharp Corporation. Control unit of sequence controller. 329,843, 9-29-92, Cl. D13-162.000.

Ishida, Katsuhiro, to Sharp Corporation. Input/output unit of sequence controller. 329,844, 9-29-92, Cl. D13-162.000.

Ishikura, Takashi; and Nakamata, Tatsuo, to Combi Corporation. Baby stroller. 329,832, 9-29-92, Cl. D12-129.000.

Isozaki, Makoto, to Fuji Photo Film Co., Ltd. Digital audio tape cassette. 329,854, 9-29-92, Cl. D14-121.000.

Isozaki, Makoto, to Fuji Photo Film Co., Ltd. Camera. 329,861, 9-29-92, Cl. D16-209.000.

Isozaki, Makoto: *See—*
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Ito, Kuniro. Holder for wine bottle and the like. 329,781, 9-29-92, Cl. D7-619.000.

Jackson, Frank W., to G. I. Supply, Inc. Pediatric endoscopic bite block. 329,901, 9-29-92, Cl. D24-176.000.

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Kiyosawa, Junichi, to Asics Corporation. Shoe sole. 329,741, 9-29-92, Cl. D2-320.000.

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Piret, Philippe. Microwave oven. 329,780, 9-29-92, Cl. D7-351.000.
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CLASSIFICATION OF PATENTS

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171 5,151,144
172 5,151,145
177 5,151,146
244.12 5,151,147
351 5,151,148
379.8 5,151,149
384.1 5,151,150
471 5,151,151
645 5,151,152
657 5,151,153

CLASS 159

13.2 5,151,154

CLASS 162

5 5,151,155
368 5,151,156

CLASS 164

97 5,150,747

CLASS 165

41 5,150,748
115 5,150,749
140 5,151,157

CLASS 166

66.4 5,150,750
81 5,150,751
88 5,150,752
278 5,150,753
294 5,150,754
297 5,150,755
318 5,150,756

CLASS 172

5 Re.34,080

CLASS 174

52.4 5,151,559
94 R 5,151,560
120 R 5,151,561

CLASS 175

323 5,150,757

CLASS 177

84 5,150,758
210 C 5,150,759
245 5,150,760

CLASS 180

141 5,150,764
197 5,150,761
208 5,150,762
252 5,150,763

CLASS 182

48 5,150,765
100 5,150,766
137 5,150,767
234 5,150,768

CLASS 184

31 5,150,769

CLASS 185

40 R 5,150,770

CLASS 187

134 5,151,562

CLASS 188

67 5,150,771
72.4 5,150,772
79.55 5,150,773
218 XL 5,150,774
299 5,150,775

CLASS 190

110 5,150,776

CLASS 192

70.17 5,150,777
98 5,150,778
106.1 5,150,779

CLASS 196

110 5,151,158

CLASS 198

333 5,150,780
349.8 5,150,781
394 5,150,782
819 5,150,783

CLASS 200

6 A 5,151,563
17 R 5,151,564
110 A 5,151,566
148 A 5,151,565
148 F 5,151,567

CLASS 202

118 5,151,159

CLASS 203

14 5,151,160
51 5,151,161

CLASS 204

153.11 5,151,163
182.1 5,151,164

299 R 5,151,165
425 5,151,166

CLASS 205

102 5,151,167
123 5,151,168
151 5,151,169
298 5,151,170

CLASS 206

4 5,150,790
202 5,150,784
217.0 5,150,785
328 5,150,786
329 5,150,787
369 5,150,788
396 5,150,789
457 5,150,791
486 5,150,792
531 5,150,793
574 5,150,794

CLASS 208

48 Q 5,151,171
144 5,151,172
430 5,151,173

CLASS 209

3.3 5,150,795
370 5,150,796
573 5,150,797
660 5,150,798

CLASS 210

97 5,151,174
108 5,151,175
178 5,151,176
194 5,151,177
198.2 5,151,178
250 5,151,179
264 5,151,180
338 5,151,181
500.27 5,151,182
500.41 5,151,183
514 5,151,184
521 5,151,185
541 5,151,186
607 5,151,187
634 5,151,188
635 5,151,189
640 5,151,190
644 5,151,191
646 5,151,192
651 5,151,193
680 5,151,194
705 5,151,195
712 5,151,196
758 5,151,197
767 5,151,198
773 5,151,199

CLASS 212

147 5,150,799

CLASS 215

11.4 5,150,800
11.6 5,150,801
235 5,150,802
357 5,150,803

CLASS 219

10.55 E 5,151,568
10.55 F 5,151,569
86.25 5,151,570
121.13 5,151,571
121.69 5,151,572
216 5,151,573
241 5,151,574
385 5,151,575
469 5,151,576
528 5,151,577
549 5,151,578

CLASS 220

212 5,150,804
217 5,150,805
331 5,150,806
359 5,150,807
375 5,150,808
404 5,150,809
5,150,810
411 5,150,811
414 5,150,812
480 5,150,813
601 5,150,814
708 5,150,815
711 5,150,816

CLASS 221

81 5,150,817
228 5,150,818

CLASS 222

79 5,150,819
95 5,150,820
132 5,150,821
145 5,150,822
386 5,150,823
590 5,151,200
600 5,151,201

CLASS 224

151 5,150,824
243 5,150,825

CLASS 227

88 5,150,826

CLASS 228

44.7 5,150,827
102 5,150,828
104 5,150,829
124 5,150,830
184 5,150,831
224 5,150,832

CLASS 229

125.15 5,150,833

CLASS 232

1 C 5,150,834

CLASS 235

375 5,151,579
381 Re.34,081
462 5,151,580
467 5,151,581
469 5,151,582

CLASS 238

50 5,150,835

CLASS 239

5 5,150,836
153 5,150,837
201 5,150,838
265.41 5,150,839
305 5,150,840
332 5,150,841
585.4 5,150,842

CLASS 241

27 5,150,843
73 5,150,844

CLASS 242

35.5 A 5,150,845
54 R 5,150,846
56 R 5,150,847
5,150,848
5,150,849
66 5,150,850
68.1 5,150,851
157 R 5,150,852
283 5,150,853
310 5,150,854

CLASS 244

1 N 5,150,855
3.2 5,150,856
12.2 5,150,857
45 A 5,150,858
58 5,150,859
63 5,150,860
91 5,150,861
110 B 5,150,862
118.5 5,150,863
219 5,150,864

CLASS 248

71 5,150,865
79 5,150,866
213.2 5,150,867
343 5,150,868
346.1 5,150,869
421 5,150,870
429 5,150,871
5,150,872
460 5,150,873
514 5,150,874
550 5,150,875

CLASS 249

86 5,151,202

CLASS 250

201.2 5,151,583
201.4 5,151,584
201.9 5,151,585
205 5,151,586
208.1 5,151,587
5,151,588
213 A 5,151,589
214 B 5,151,591
215 5,151,590
228 5,151,592
234 5,151,593
306 5,151,594
316.1 5,151,595
327.2 5,151,596
5,151,597
336.1 5,151,598
363.03 5,151,599
372 5,151,600
390.04 5,151,601
458.1 5,151,603
484.1 5,151,604
492.2 5,151,605
551 5,151,602
5,151,606
556 5,151,607
561 5,151,608
5,151,609

CLASS 251

14 5,150,876
40 5,150,877
129.01 5,150,878
129.21 5,150,879
149.3 5,150,880
174 5,150,881
193 5,150,882
367 5,150,883

CLASS 252

8.551 5,151,203
52 R 5,151,204
56 R 5,151,205
62.51 5,151,206
67 5,151,207
174.017 5,151,210
174.14 5,151,208
174.15 5,151,209
186.1 5,151,211
186.38 5,151,212
299.6 5,151,213
299.61 5,151,214
301.6 F 5,151,215
307 5,151,216
312 5,151,217
351 5,151,218
364 5,151,219
392 5,151,220
500 5,151,221
511 5,151,222
547 5,151,223
586 5,151,224
607 5,151,225

CLASS 254

209 5,150,884

CLASS 256

22 5,150,885

CLASS 264

25 5,151,226
41 5,151,227
42 5,151,228
51 5,151,229
83 5,151,230
108 5,151,231
130 5,151,232
136 5,151,238
153 5,151,233
176.1 5,151,234
209.5 5,151,235
257 5,151,236
5,151,237
272.11 5,151,239
284 5,151,240
314 5,151,241
572 5,151,242

CLASS 266

78 5,151,243

CLASS 267

220 5,150,886

CLASS 269

71 5,150,887
254 CS 5,150,888

CLASS 270

53 5,150,889

CLASS 271

9 5,150,890
35 5,150,891
98 5,150,892
157 5,150,893
302 5,150,894

CLASS 273

29 R 5,150,895
67 R 5,150,896
72 R 5,150,897
85 C 5,150,898
85 G 5,150,899
146 5,150,900
186.1 5,150,902
186.2 5,150,901
188 A 5,150,903
192 5,150,904
218 5,150,905
220 5,150,906
240 5,150,907
262 5,150,908
428 5,150,909

CLASS 277

235 B 5,150,910

CLASS 280

502 5,150,911
605 5,150,912
612 5,150,913
616 5,150,914
707 5,150,915
5,150,916
5,150,917
716 5,150,918
732 5,150,919
777 5,150,920

CLASS 281

42 5,150,921

CLASS 285

21 5,150,922
5,150,923
101 5,150,924
5,150,925
110 5,150,926
189 5,150,927
205 5,150,928
231 5,150,929
319 5,150,930
381 5,150,931

CLASS 290

55 5,151,610

CLASS 292

202 5,150,932
216 5,150,933
288 5,150,934

CLASS 293

136 5,150,935

CLASS 294

104 5,150,936
119.1 5,150,937
131 5,151,162
156 5,150,938

CLASS 296

37.1 5,150,939
39.2 5,150,940
152 5,150,941
190 5,150,942
201 5,150,943
203 5,150,944

CLASS 297

184 5,150,945
194 5,150,946
229 5,150,947
301 5,150,948

CLASS 301

37 S 5,150,949

CLASS 303

100 5,150,950
5,150,951
109 5,150,952

CLASS 307

202.1 5,151,611
234 5,151,612
243 5,151,613
272.3 5,151,614
443 5,151,615
451 5,151,616
462 5,151,617
465 5,151,623
471 5,151,618
473 5,151,619
475 5,151,620
5,151,621
5,151,622
498 5,151,624
529 5,151,625

CLASS 310

331 5,151,626

CLASS 312

9.58 5,150,953

CLASS 313

477 R 5,151,627
499 5,151,628
504 5,151,629
602 5,151,630

CLASS 315

127 5,151,631
169.1 5,151,632
248 5,151,633
307 5,151,634
370 5,151,635

CLASS 318

272 5,151,636
376 5,151,637
434 5,151,638
568.18 5,151,639
696 5,151,640
762 5,151,641
779 5,151,642

CLASS 320

2 5,151,643
14 5,151,644
23 5,151,645

CLASS 322

28 5,151,646
99 5,151,647

CLASS 323

282 5,151,648

CLASS 324

127 5,151,649
158 F 5,151,650
158 P 5,151,651
5,151,652
5,151,653
160 5,151,654
309 5,151,655
5,151,656
326 5,151,657
346 5,151,658
458 5,151,659
689 5,151,660

CLASS 328

14 5,151,661
127 5,151,662

CLASS 330

41 5,151,663
149 5,151,664

CLASS 331

8 5,151,665
64 5,151,666
117 R 5,151,667

CLASS 332

124 5,151,668

CLASS 333

81 R 5,151,669
126 5,151,670
189 5,151,672
249 5,151,673

CLASS 335

16 5,151,674
78 5,151,675
172 5,151,671

CLASS 338

61 5,151,676
99 5,151,677

CLASS 340

310 R 5,151,838
321 5,151,678
326 5,151,679
384 E 5,151,680
454 5,151,681
514 5,151,682
518 5,151,683
572 5,151,684
605 5,151,685
703 5,151,686
706 5,151,687
707 5,151,688
784 5,151,689
5,151,690
5,151,691
825.28 5,151,692
825.3 5,151,693
825.44 5,150,954
5,151,694
870.33 5,151,695
968 Re.34,082

CLASS 341

22 5,151,696
51 5,151,697
52 5,151,698
58 5,151,699
156 5,151,700

CLASS 342

20 5,151,701
134 5,151,702
199 5,151,703
360 5,151,704
368 5,151,705
372 5,151,706

CLASS 343

705 5,151,707
715 5,151,711
722 5,151,708
741 5,151,709
766 5,151,710

CLASS 346

1.1 5,151,712
108 5,151,713
5,151,714
140 R 5,151,715
5,151,716
157 5,151,717
160 5,151,718
160.1 5,151,719

CLASS 351

46 5,151,720
121 5,151,721
156 5,151,778
158 5,151,722
161 5,151,723

CLASS 352

129 5,151,725

CLASS 354

75 5,151,726
76 5,151,727
83 5,151,728
173.11 Re.34,083
195.12 5,151,729
275 5,151,730
321 5,150,955
324 5,151,731
402 5,151,732

CLASS 355

45 5,151,733
200 5,151,734
207 5,151,735
208 5,151,736
211 5,151,737
245 5,151,738
5,151,739
246 5,151,740
257 5,151,741
285 5,151,742
288 5,151,743
296 5,151,744
313 5,151,745

CLASS 356

1 5,151,746
5 5,151,747
32 5,151,748
128 5,151,752
142 5,151,753
350 5,150,956
356 5,151,754
375 5,151,749
401 5,151,750
402 5,151,751
414 5,151,755

CLASS 357

17 5,151,724
5,151,756
22 5,151,757
5,151,758
23.3 5,151,759
23.4 5,151,762
23.5 5,151,760
5,151,761
26 5,151,763
27 5,151,764
34 5,151,765
38 5,151,766
43 5,151,767
51 5,151,768
53 5,151,769
5,151,770
70 5,151,771
71 5,151,772
74 5,151,773
79 5,151,774
80 5,151,775
81 5,151,776
5,151,777

CLASS 358

12 5,151,779
21 R 5,151,780
45 5,151,781
86 5,151,782
133 5,151,783
136 5,151,784
141 5,151,785
148 5,151,786
162 5,151,787
188 5,151,788
194.1 5,151,789
225 5,151,790
261.2 5,151,791
327 5,151,792
335 5,151,793
347 5,150,957
447 5,151,794
448 5,151,795
461 5,151,796
474 5,151,797

CLASS 359

1 5,151,798
11 5,151,799
14 5,151,800

40 5,151,801
51 5,151,802
56 5,151,803
5,151,804
57 5,151,805
59 5,151,806
5,151,807
78 5,151,808
198 5,151,810
5,151,811
201 5,151,812
202 5,151,813
209 5,151,814
220 5,151,815
275 5,151,816
328 5,151,817
344 5,151,818
350 5,151,819
354 5,151,820
462 5,151,821
559 5,151,822
565 5,151,823
604 5,151,824
634 5,151,825
742 5,151,826
846 5,151,809
848 5,151,827
871 5,151,828
886 5,151,829

CLASS 360

32 5,151,830
39 5,151,831
85 5,151,832
5,151,833
92 5,151,834
96.5 5,151,835
99.08 5,151,836
103 5,151,837
108 5,151,839

CLASS 361

13 5,151,840
86 5,151,841
93 5,151,842
149 5,151,843
179 5,151,844
234 5,151,845
306 5,151,846
395 5,151,847
502 5,151,848

CLASS 362

61 5,151,849
66 5,150,958
75 5,151,850
80 5,150,959
83.2 5,150,960
5,150,961
101 5,150,962
123 5,150,963
251 5,150,964
260 5,150,965
337 5,150,966

CLASS 363

25 5,151,851
131 5,151,852
160 5,151,853

CLASS 364

184 5,151,854
413.03 5,151,856
419 5,151,857
424.02 5,151,859
424.05 5,151,860
424.1 5,151,858
426.02 5,151,861
454 5,151,862
470 5,151,863
474.23 5,151,864
483 5,151,865
5,151,866
489 5,151,867
490 5,151,868
497 5,151,869
556 5,151,870
557 5,151,871
571.05 5,151,872
710.12 5,151,873
752 5,151,874
784 5,151,875

CLASS 365

94 5,151,876
145 5,151,877
189.01 5,151,878
190 5,151,879
201 5,151,880
233 5,151,881

CLASS 366

206 5,150,957
288 5,150,968

CLASS 367

82 5,151,882
138 5,151,883

CLASS 368

10 5,151,884
110 5,151,885
157 5,151,886

CLASS 369

44.110 5,151,890
44.32 5,151,887
5,151,888
44.37 5,151,889
59 5,151,891
109 5,151,892
116 5,151,893
291 5,151,894

CLASS 370

85.1 5,151,895
85.13 5,151,896
5,151,897
85.15 5,151,898
94.1 5,151,899
94.3 5,151,900
110.1 5,151,901

CLASS 371

27 5,151,903
39.1 5,151,905
43 5,151,904
51 5,151,902
51.1 5,151,906
66 5,151,907

CLASS 372

6 5,151,908
22 5,151,909
31 5,151,910
32 5,151,911
46 5,151,912
5,151,913
5,151,914
50 5,151,915
61 5,151,916
102 5,151,917

CLASS 373

27 5,151,918

CLASS 374

128 5,150,969

CLASS 375

1 5,151,919
5,151,920
5,151,921
5 5,151,922
5,151,923
12 5,151,924
82 5,151,925
84 5,151,926
119 5,151,927

CLASS 376

245 5,151,244
271 5,151,245

CLASS 378

65 5,151,931
119 5,151,928

CLASS 379

38 5,151,946
57 5,151,929
5,151,930
93 5,151,972
106 5,151,932
159 5,151,933
5,151,934
240 5,151,935
403 5,151,936
410 5,151,937

CLASS 380

43 5,151,938

CLASS 381

15 5,151,939
43 5,151,940
46 5,151,941
94 5,151,942
151 5,151,944
189 5,151,943

CLASS 382

1 5,151,945
6 5,151,947
7 5,151,948
9 5,151,949
13 5,151,950
19 5,151,951
29 5,151,952
41 5,151,953
5,151,954

CLASS 383

76 5,150,970
84 5,150,971

CLASS 384

97 5,150,972
448 5,150,973
463 5,150,974
465 5,150,975

CLASS 385

6 5,151,955
11 5,151,956
41 5,151,957
50 5,151,958
5,151,959
53 5,151,960
60 5,151,961
86 5,151,962
88 5,151,963
98 5,151,964
122 5,151,965
128 5,151,966
138 5,151,967

CLASS 395

2 5,151,968
24 5,151,969
5,151,970
27 5,151,971
109 5,151,973
128 5,151,974
153 5,151,975
166 5,151,976
200 5,151,977
5,151,978
325 5,151,979
375 5,151,980
5,151,981
425 5,151,982
5,151,983
500 5,151,984
5,151,985
550 5,151,986
575 5,151,987
600 5,151,988
5,151,989
650 5,151,990
700 5,151,991
750 5,151,855
5,151,992
775 5,151,993
800 5,151,994
5,151,995
5,151,996
5,151,997
5,151,998
5,151,999
5,152,000
5,152,001

CLASS 400

124 5,150,976
703 5,150,977

CLASS 401

14 5,150,978
209 5,150,979

CLASS 403

24 5,150,980
122 5,150,981
232.1 5,150,982
402 5,150,983

CLASS 404

26 5,150,984

CLASS 405

128 5,150,985
223 5,150,986
224 5,150,987
258 5,150,988
303 5,150,989

CLASS 406

50 5,150,990
67 5,150,991

CLASS 407

110 5,150,992

CLASS 408

5,150,993

CLASS 409

135 5,150,994
234 5,150,995
259 5,150,996

CLASS 411

511 5,150,997

CLASS 412

14 5,150,998

CLASS 414

24.5 5,150,999
187 5,151,000
225 5,151,001
339 5,151,002
428 5,151,003
437 5,151,005
495 5,151,004
626 5,151,006
744.2 5,151,007
744.5 5,151,008
793.5 5,151,009

CLASS 415

169.1 5,151,010

CLASS 416

5 5,151,011
95 5,151,012
221 5,151,013
237 5,151,014

CLASS 417

32 5,151,016
45 5,151,017
312 5,151,018
415 5,151,015
474 5,151,019

CLASS 418

55.2 5,151,020
93 5,151,021

CLASS 419

2 5,151,246
13 5,151,247

CLASS 420

35 5,151,248
445 5,151,249

CLASS 422

2 5,151,250
119 5,151,251
179 5,151,253
180 5,151,254
186.05 5,151,255
186.3 5,151,252

CLASS 423

210 5,151,256
230 5,151,257
235 5,151,258
245.3 5,151,022
328 5,151,259
412 5,151,260
448 5,151,261
561.1 5,151,262
659 5,151,263

CLASS 424

1.1 5,151,264
85.5 5,151,265
85.8 5,151,266
89 5,151,023
5,151,267
94.64 5,151,268
401 5,151,269
5,151,270
443 5,151,271
450 5,151,272
465 5,151,273
630 5,151,274

CLASS 425

84 5,151,275
110 5,151,276
112 5,151,277
130 5,151,278
141 5,151,024
178 5,151,279
186 5,151,280
199 5,151,025
204 5,151,026
505 5,151,281
562 5,151,282

CLASS 426

93 5,151,283
106 5,151,284
241 5,151,285
324 5,151,286
432 5,151,287
474 5,151,288
557 5,151,289
576 5,151,290
581 5,151,291
601 5,151,292
614 5,151,293

CLASS 427

11 5,151,294
12 5,151,295
38 5,151,296
39 5,151,379
46 5,151,297
77 5,151,298
96 5,151,299
5,151,300
140 5,151,302
178 5,151,303
250 5,151,304
252 5,151,305
294 5,151,301
434.5 5,151,306

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	318	329,739
	320	329,740
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	78	329,747
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	106	329,749
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	129	329,752
D6—	311	329,753
	326	329,754
		329,755
	338	329,756
	348	329,757
	381	329,758
	385	329,759
	397	329,760
	416	329,761
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	429	329,763
	462	329,764
	465	329,765
	467	329,766
	486	329,767
	495	329,768
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	501	329,770
	502	329,771
		329,772
	508	329,774
	520	329,773
	551	329,775
	570	329,776
	601	329,777
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	351	329,779
		329,780
	619	329,781
	629	329,782
	641	329,783
	681	329,784
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	50	329,790
		329,791
	57	329,792
	60	329,793
	68	329,794
	70	329,795
	80	329,796
	93	329,797
	102	329,798
	331	329,799
	346	329,800
		329,801
D9—	300	329,802
	332	329,803
	341	329,804
	344	329,807
	415	329,808
	430	329,806
	443	329,809
	447	329,810
	456	329,811
	520	329,805
	523	329,812
	524	329,813
	526	329,814
	528	329,815
		329,816
	556	329,817
D10—	39	329,818
	75	329,819
	97	329,820
	103	329,821
	104	329,822
		329,823
		329,824
	106	329,825
D11—	13	329,828
	124	329,826
	160	329,827
D12—	15	329,829
	84	329,830
	114	329,831
	129	329,832
	130	329,833
	133	329,834
		329,835
	155	329,836
	156	329,837
	318	329,838
D13—	118	329,839
	146	329,840
	147	329,841
		329,842
	162	329,843
		329,844
	183	329,845
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	106	329,853
	113	329,847
	115	329,848
	121	329,854
		329,855
	137	329,849
	164	329,850
	165	329,851
		329,852
	168	329,856
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	139	329,858
		329,859
D16—	133	329,860
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		329,863
	218	329,864
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		329,866
	22	329,867
D18—	43	329,868
	49	329,869
	55	329,870
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	92	329,875
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	108	329,881
		329,882
		329,883
		329,884
	130	329,886
	131	329,885
	195	329,887
	211	329,888
	217	329,889
		329,890
	219	329,906
	220	329,904
		329,905
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	142	329,908
		329,909
D23—	215	329,910
	228	329,892
	250	329,911
	252	329,912
	262	329,891
	310	329,893
	377	329,894
	393	329,895
	413	329,896
D24—	106	329,897
	133	329,898
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	87	329,920
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	56	329,923
	77	329,924
D29—	10	329,925
	22	329,926
D30—	145	329,927
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41 : 7,988

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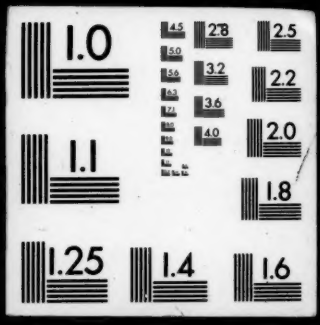
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